



NOVEMBER 15, 1991

VOLUME FIVE NUMBER FOUR

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Strategic Outlook On Managing Change: How To Turn Corporate Handsprings Without Coming Undone

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Avery More

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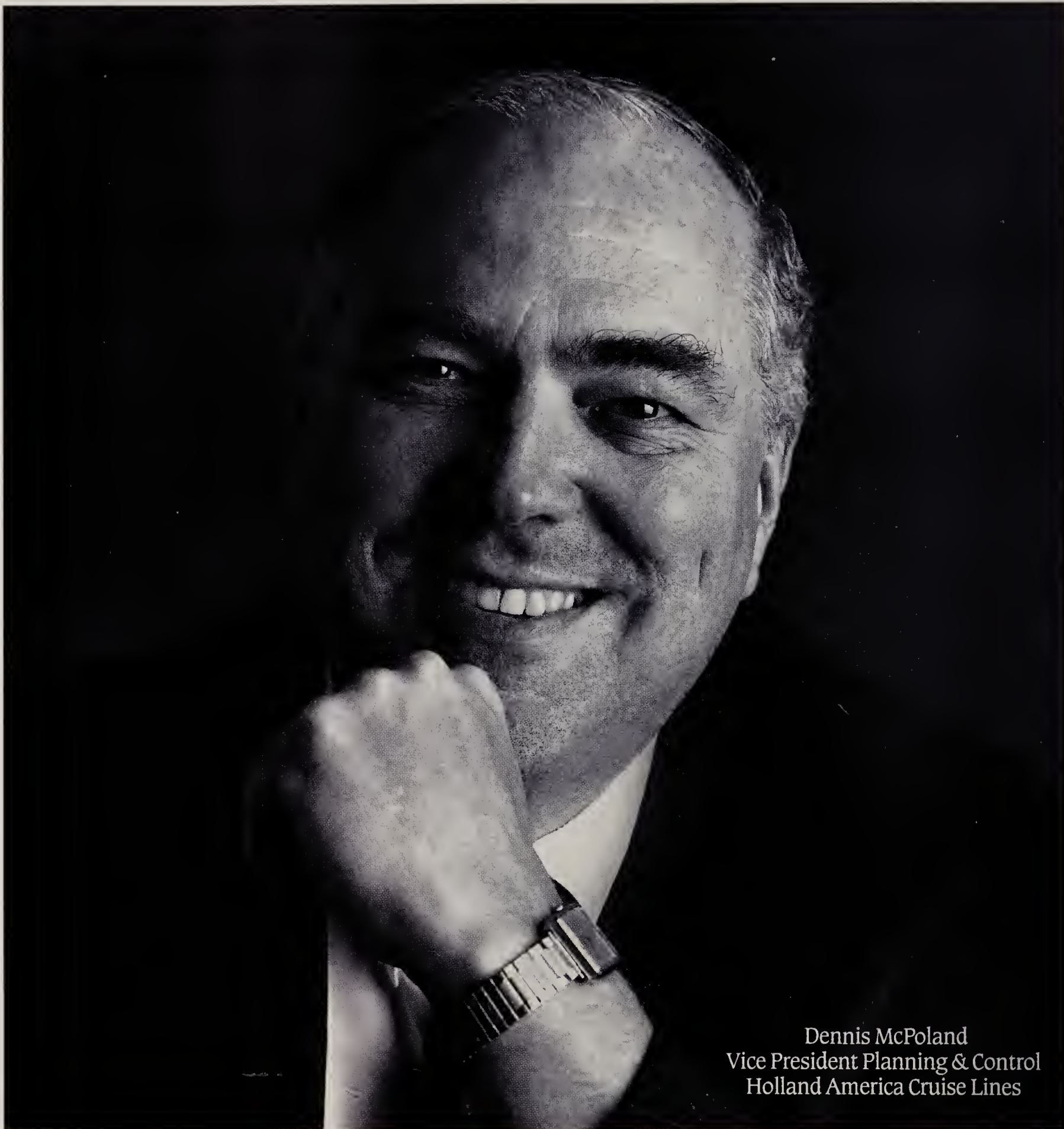
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CIO

VOLUME 5, NUMBER 4

STRATEGIC OUTLOOK

CHANGE MANAGEMENT

Pains and Gains

Change is the bitter medicine that organizations must take if they want to survive in a highly mutable business world. Learning to manage change can make the pill a little easier to swallow.

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Finding a New Niche

In its previous existence as a full-service bank, Continental Bank Corp. was at death's door. Today the institution is enjoying improved health in a slimmer, sleeker incarnation as a specialized banker to corporations and the wealthy.

By Thomas Kiely

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Mending Their Ways

Plagued by ineffectiveness and inefficiency, PC reseller CompuCom had no choice but to revamp its core distribution process. As a result, the company not only survived—it prospered.

By Allan E. Alter

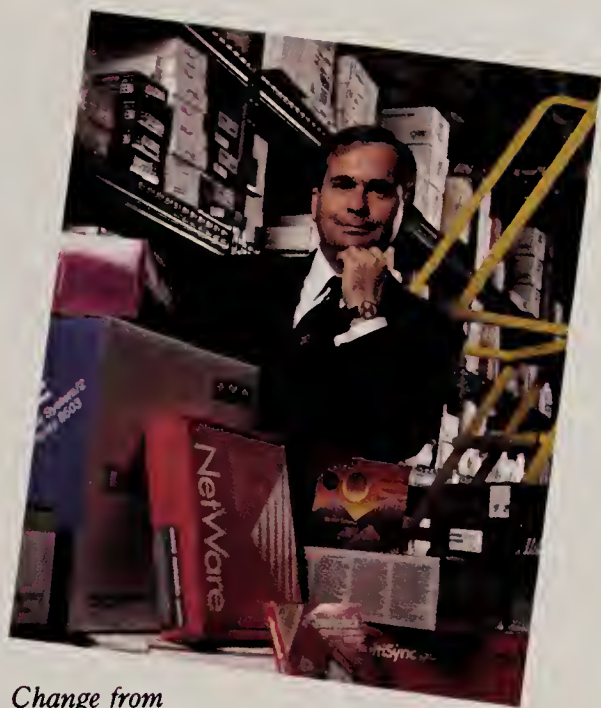
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Reinventing the Workforce

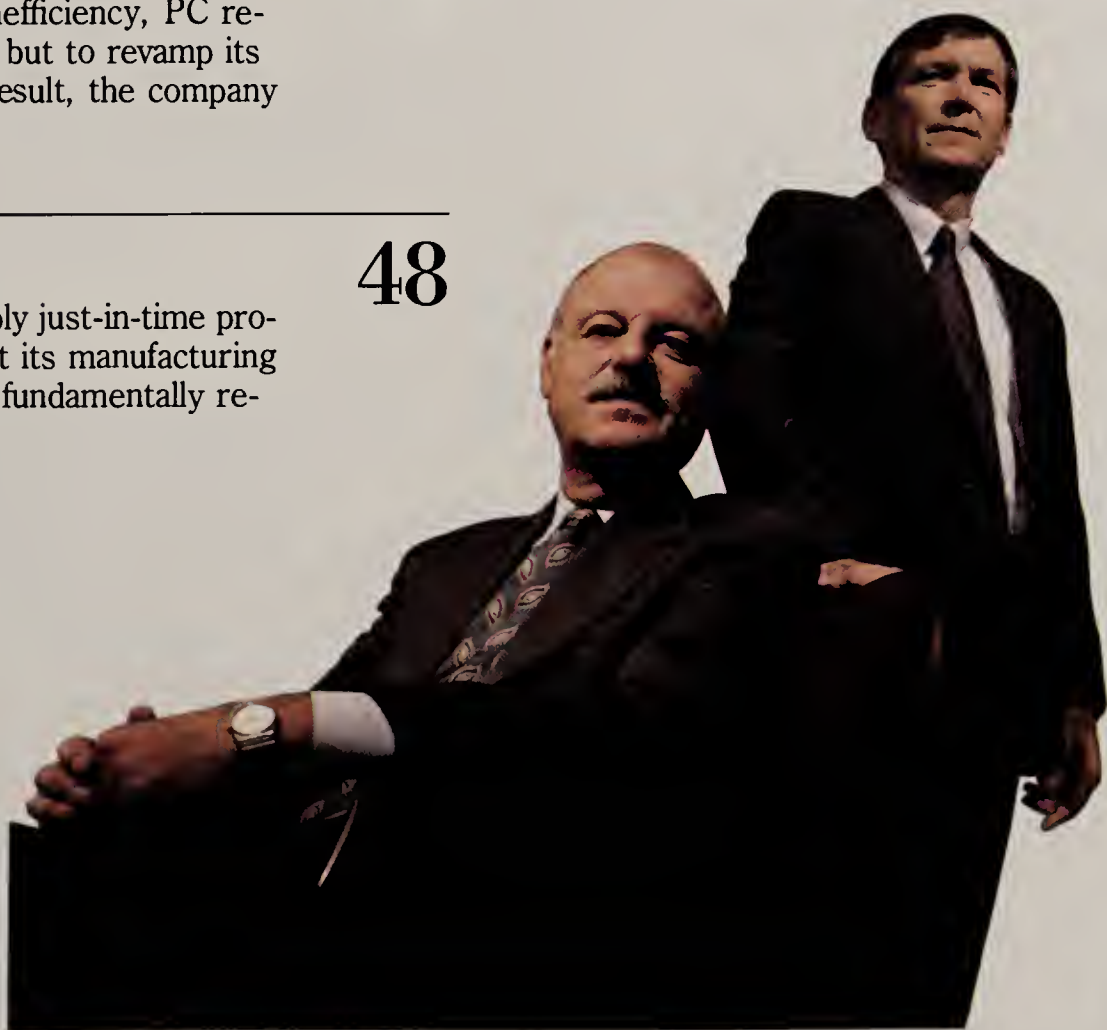
When Tellabs Inc. decided to apply just-in-time processes and total quality control at its manufacturing plant in Austin, Texas, it had to fundamentally reshape the roles of its employees.

By Thomas Kiely

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Change from within 44
Cover photo by David Buffington



A new identity 40

M O R E ► ► ►

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FEATURES

Selling Points

Although it is neither big nor complex, Calvert's executive information system is helping the retailer crack down on markdowns.

By Meghan O'Leary

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Power Users

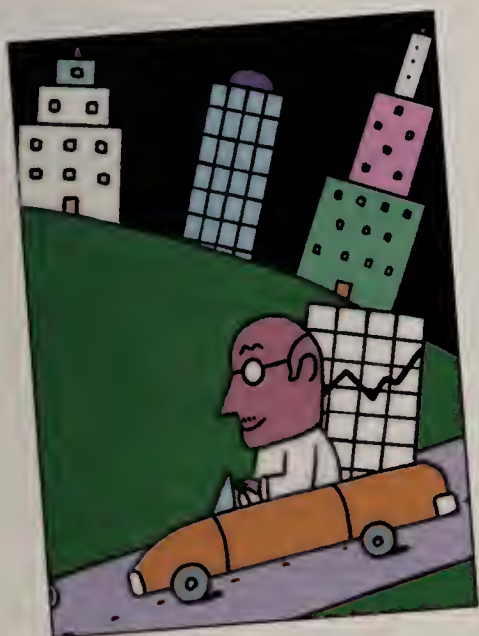
Chief executives who know their way around computer systems testify to the empowering virtues of hands-on use.

By Mary E. Boone

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A sharper image 58

COLUMNS

INSIGHTS: PROCEEDING WITH CAUTION

Woe to those CIOs who commit their organizations to downsizing without planning for the management and technical issues that may complicate the process.

By Marc Dodge

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An emerging class of sophisticated tools is helping electronic imaging work its way into the heart of organizational computing.

By Scott Wallace

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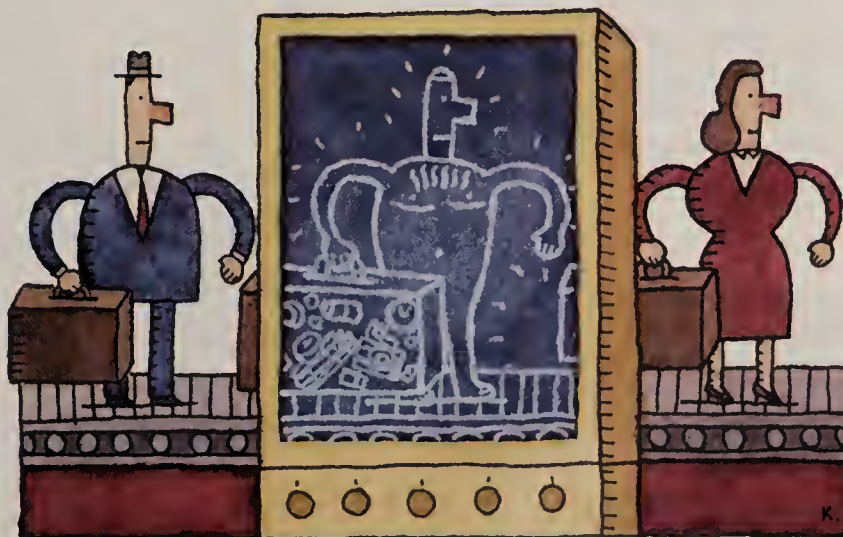
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Managing change is the one constant that permeates the existence of the CIO. And it looks like the rate of change isn't going to slow down anytime soon; in fact, change has seeped into every nook and cranny of the organization. This month our Strategic Outlook section, beginning on Page 33, approaches managing change from three perspectives: altering the positioning of a company, creating new operational processes and transforming the role of employees.

After a bout of painful choices, Continental Bank Corp. in Chicago divested its broad line of banking businesses in favor of concentrating on corporate customers. Despite this change of focus,

executives at the company found they had to develop the capability to bring a variety of financial products, many with short shelf lives, to customers quickly. The need to be so flexible created a gargantuan change in IS operations at the bank. Virtually all of the bank's information technology activities have been outsourced. Former CIO John Gigerich, who was a major proponent of the outsourcing strategy, stepped down in the final weeks of negotiations with outsourcer IBM. Technology was not a core competency of the bank, he explained, noting that the bank also outsourced its legal department, cafeteria and messenger operations.

Changing its distribution process created chaos at CompuCom Systems, a Dallas-based reseller and retailer of microcomputers. In the interest of providing better customer service (including next-day delivery of products and fewer shipping errors), CompuCom decided to centralize its four distribution centers into a single warehouse in Dallas and develop an information system to manage and support that strategy. Carrying out the physical and technology-related aspects of the strategy simultaneously created a panic mode that, at one point, reduced the salespeople to handwriting orders.

Tellabs Inc. redefined the role people played at its manufacturing plants. Fifty-two job titles dispersed throughout seven hierarchical levels were compressed into one, and the role of supervisors was modified so drastically that employees had to reapply for the new positions. Workers were reorganized into cross-functional work cells—teams responsible for products—in order to support just-in-time manufacturing.

These three stories dramatically illustrate what happens when companies move to adapt to today's business environment. According to Gigerich, "The one fundamental about change that we all forget is that once you begin the process, things will be different. But it may not be what you thought it would be."

Marcia Blumenthal



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Editorial Offices CIO Publishing Inc., 492 Old Connecticut Path, P.O. Box 9208, Framingham, Mass. 01701-9208 (508) 872-8200. **Subscriber Services** (800) 788-4605.

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Across the country and around the world, companies are undergoing fundamental changes in the way they structure their organizations and deliver products and services to their customers. As evidenced by the three businesses profiled in this issue of *CIO*, the change process is typically spurred by competitive factors that threaten a company's ultimate survival.

The companies that succeed in navigating the uncharted waters of change are those which invest significant

time, energy and dollars into managing the human side of the equation. These companies have managers who instinctively understand that their ability to implement change and succeed in their chosen markets is made possible by *people*. They make a significant effort to communicate with employees—explaining what the changes are, why they are necessary and how employees will be affected.

Information technology can facilitate change management. For example, it can measure the new parameters set in place to monitor product-development life cycles and customer satisfaction. Or it can serve as a training vehicle, helping employees to develop new skill sets required for success in their changing jobs.

I'm encouraged to see chief information officers taking a lead role in change management. By providing for critical information-management needs, they can help the organization to evaluate how well it is fulfilling its mission, quantify the benefits of change and make the change process less frightening to those who must implement it.

Enjoy this issue.

Wharton L. Gerrity

P.S. We invite you to join us for the next *CIO Perspectives* conference, "The Business of IT: Finding the Payoff," featuring Peter Drucker, to be held March 8-11, 1992, at the new Loew's Coronado in San Diego. To ensure your participation, please call our toll-free registration hot line at 800 366-0246. Or fill out and return the business reply card included with this issue of *CIO*.

Coming In CIO

Up and Running

New York City's off-track betting parlors were finishing last in revenues and technology until new management transformed the agency into a model of a fleet-footed, opportunistic service organization. IT is playing a lead role.

The Dean's List

Globalization, organizational change, complex private/public-sector links, a culturally diverse workforce—these are some of the things that Wharton Dean Tom Gerrity wants his MBA candidates exposed to. And, oh yes, IT is important too.

A Helping Hand

At first the help desk acted primarily as a stop-gap, put quickly into place to answer end-user questions or to offload tasks from a burdened programming staff. Today help-desk personnel have become strategic partners within IS.

Robocop Redux

Technology is making itself felt in law enforcement, from the use of relational databases to DNA "fingerprinting." IT should make it easier to catch and convict criminals—if the cops and the courts will accept it.

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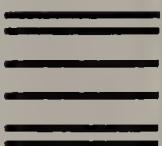
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Within the next 10 years, both the structure of organizations and the jobs of the senior people within organizations will be drastically changed, primarily because of information. This will require information responsibility from everybody, especially from senior management.

PETER F. DRUCKER

”



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"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity—the specification always matches the executing system."

Paul R. Hessinger
Chief Technology Officer
Computer Task Group



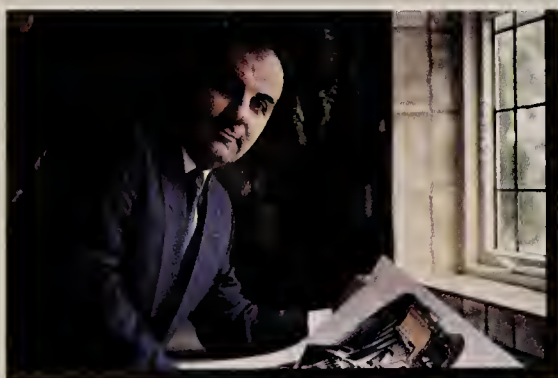
"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

John F. Mott
President
AMR Travel Services



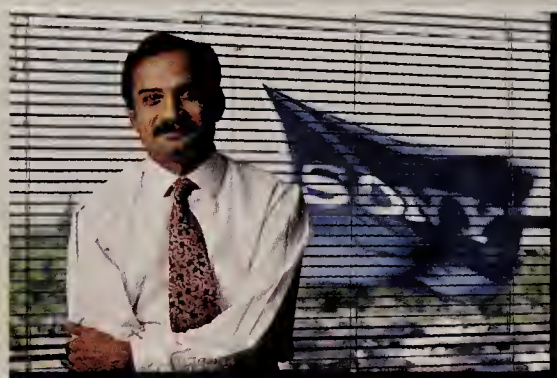
"Our users were extremely pleased when we finished our first project—a 60-transaction system—in one-half the budgeted time. We had tried interfaced CASE tools without success. IEF integration makes the difference."

Giorgio Sorani
Division Head - MIS
Lubrizol



"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development."

Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce



"The IEF offers dramatic improvements in productivity, yet it's easy to learn. One example: We trained 23 developers, including 18 new hires, and then completed a large order processing system—300 transactions—all in only 20 months."

Venkat (Vinnie) Tiruvilumala
Director, CPC/PPC Information Systems
SONY Corporation



"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

Mogens Sorensen
Chief Consultant
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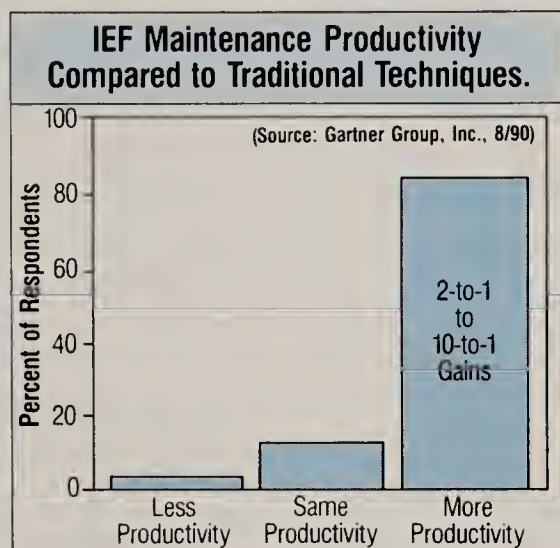
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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follow. We are committed to increased environmental independence in support of the Open Systems concept.

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INSTRUMENTS

TRENDLINES

WATCH OUT, PRUNEFACE

OK, this isn't the first time someone has prophesied we will all one day be toting Dick Tracy-type miniature communicators. But this may be the first time anybody has predicted a market value for them. Arthur D. Little Inc., the consultancy based in Cambridge, Mass., claims calculator-size portable telephones will wind up in



half of all U.S. households within 10 years of full availability, generating annual sales of \$30 to \$40 billion. Now all somebody has to do is build the things.

Unlike today's car phones, these personal-communication devices will work in any location and should appeal to consumers as well as corporate users. They will also cost less to use than cellular service.

Little conducted a national survey to determine interest in the hypothetical gadgets. Not only were people interested, they even proposed "options," such as a wristwatch-sized PC terminal and headsets with lapel microphones. Take note, Sharper Image. ■

LOGISTICS MANAGEMENT

IN THE SERVICE OF SERVICE INDUSTRIES

Once the exclusive domain of military strategists, logistics management has gradually gained a place in manufacturing, where the efficient movement of goods and supplies means a more productive production line and lower warehousing costs. From improved production, logistics strategists would be wise to move on to better service, targeting such service industries as telecommunications, hospitals, retail banking and high-tech field service, according to a recent book commissioned by the Council of Logistics Management, a nonprofit professional organization based in Oak Brook, Ill.

Written by Jack Barry and Peter Smith of Arthur D. Little, and John Coyle of Pennsylvania State University, *Logistics In Service Industries* highlights ways in which service organizations can apply the principles of logistics management to cut costs and improve customer service. The authors studied 50 companies in each of the four industries mentioned above, and found that logistics management is not widely practiced in the service sector, where people and equipment account for 75 percent of expenditures, compared to only 20 percent in goods-producing industries.

As part of their study of 50 telecommunications companies, for instance, the authors found three key areas to which logistics-management principles could be applied for dramatic time and cost savings. Internal business practices could be speeded up and made more flexible in order to accommodate customers' increasingly sophisticated service requirements. The "or-

der-taking" mentality that persists at many telephone companies could be replaced with competitive, customer-focused business practices. And telecommunications suppliers could learn to manage their supply chains—from cable to vehicles—and foster cooperation among suppliers in order to reduce costs and

increase efficiency.

The book breaks down the language of logistics in order to illustrate its value in non-manufacturing industries by creating two management approaches: supply-chain logistics and service-response logistics. Supply-chain logistics applies to the physical flow of materials and the system flow of information related to purchasing, warehousing and distribution of materials. Service-response logistics is the process of coordinating non-material activities necessary to provide service in a cost-effective way that best serves the customer. ■

YIELD-MANAGEMENT FOR THE LONG HAUL

A mainstay of the airline industry—the yield-management system—is working on the railroad now. American Airlines Decision Technologies (AADT) and Amtrak, the national passenger railroad, jointly developed the first fully automated railroad yield-management system.

The system is designed to increase passenger revenue and profits through effective reservation inventory control, according to AADT. Its decision-support capabilities enable it to automatically analyze and mix the number of high- and low-yield fares for the same train journey. The system handles discount allocation and traffic flow, and it will support approximately 1,200 reservations agents as well as interface with Amtrak's links to Sabre, PARS, Apollo and System One agents.

"While Amtrak doesn't compete on the same basis as airlines, we use a lot of the same techniques and tools to sell our business," said Robert Gall, vice president of passenger marketing and sales. "Implementation of a yield-management system was a logical step." ■

FOREIGN OPPORTUNITIES

WAY-OUT OUTSOURCING

For CIOs reeling from the double whammy of labor shortages and cost constraints, offshore outsourcing could be the crutch that keeps software-development operations from collapsing. But finding the right peo-

ple can be problematic, and the immigration, taxation and other legal hassles make foreign recruitment all the more daunting. A new Mitsubishi International Corp. subsidiary is hoping to ease the pain by facilitating offshore relation-

TRENDLINES

ships for U.S. clients.

Turning to offshore sources can reduce development costs by as much as 50 percent, according to Mitsubishi's Global Software Services Group, which has offices in San Francisco, Los Angeles and New York. Even if the project requires foreign programmers to temporarily relocate to the United States, savings can still run in the 20-to-30 percent range, the group claims.

Cost savings aside, overseas recruitment may loom larger as the domestic labor pool shrinks. Mitsubishi cites statistics that show the number of U.S. students earning technical undergraduate degrees shrinking from 8.8 percent of all undergraduates several years ago to just 2.2 percent in 1989.

As IS departments are called on to bring users closer to the development process, moving that process from Dublin, Ohio, to Dublin, Ire-

land, may seem to work to the contrary. But group partner Robert Ackerman Jr. argues that if commodity-type coding is sent offshore, the more limited number of domestic IS staffers will have more time to spend working closely with users.

Mitsubishi and its partners spent two years interviewing hundreds of software-development professionals in 15 countries, screening them on the basis of language, cultural background, technical expertise and equipment access. After lining up the right candidates for a U.S. client, Mitsubishi calls in partners from Big Six accounting firm Deloitte & Touche and law firms Fenwick & West and Bryan, Cave McPheeters & McRoberts. They guide contract negotiations to ensure the corporate client's best interests are served in the areas of taxation and intellectual property rights. ■

COMMUNICATING IN THE GLOBAL VILLAGE

One of the benefits of technology is that it can provide access to the best services regardless of an individual's or organization's location. WORDNET Inc., an electronic translation service based in Acton, Mass., is a good example. With a database of over 700 electronically linked translators around the globe, WORDNET offers clients customized translations of all kinds. For example, a mid-sized manufacturing firm looking to market its products abroad can have its brochures, legal documents, and sales and marketing materials accurately translated into the appro-



priate languages with all the nuances intact.

When a job comes in, WORDNET searches its database of freelance translators by a number of criteria, including language, education and specialization. Clients usually fax their materials to the company; they are keyed into a computer, then transmitted electronically to the chosen translator—a Turkish national living in Berlin, let's say—working from home with a computer and modem. The translated material is returned to WORDNET, who then forwards it to a professor in Ankara, for instance, for final editing. The company's in-house typesetting facilities provide clients with a finished product, and the entire job takes no more than a few days.

The company specializes in highly technical translations, according to President and Founder Lee Chadeayne. While the majority of its clients are small and mid-sized U.S. firms exploring the global marketplace, the company has a number of foreign, governmental, nonprofit and media clients as well. And with so many breakaway Soviet republics pulling for a return to their native tongues, WORDNET may have an enormous source of new clients soon. ■

INFORMATION OVERLOAD

WASHINGTON

Mark Alan Stamaty

Syndicated cartoonist Mark Alan Stamaty suggests an Eighth Deadly Sin for the information age. ■





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TAKE ADVANTAGE OF CHANGESM

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CAREER MOVES

ALLEN HANKINSON, chief of the Systems and Software Technology Division at the National Institute of Standards and Technology, has been elected to the board of directors of UniForum, the international association of open-systems professionals headquartered in Santa Clara, Calif. Hankinson, who heads the development of standards and guidelines for office systems and software engineering at NIST, is the first UniForum board member to represent a federal user organization.

ARTHUR BLOCK has been named chief technology officer at Evernet Systems Inc., a Los Angeles-based systems integrator providing design, installation and service for local- and wide-area networks nationwide. Block joins Evernet from Manufacturers Hanover Trust, where he was vice president of end-user automation support for the Global Banking Sector. As CTO, Block reports directly to Chairman and CEO Luther Nussbaum. He will be based in New York.

STEVE MILSTON, CIO of Health Risk Management Inc., has been promoted to the position of vice president of information services and CIO. In his new capacity, Milston will not only oversee the IS department and direct the company's IS research and development arm, but he will also be responsible for IS strategic planning. Health Risk Management is a national, full-service health-care information and management company headquartered in Minneapolis. ■

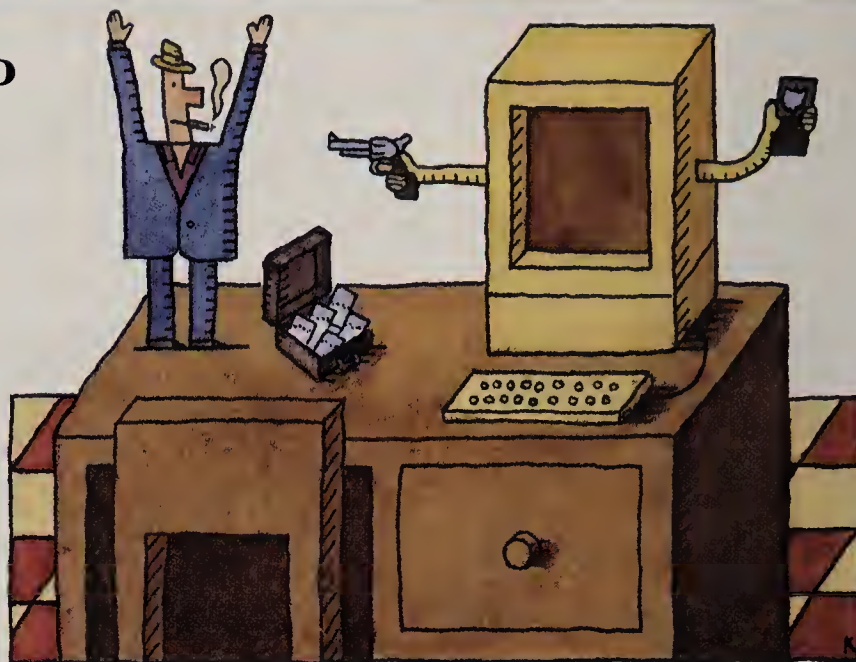
NARCOTICS ENFORCEMENT

THE DESKTOP DRUG WAR

The creators of *Miami Vice* undoubtedly made a wise decision when they put Sonny Crockett behind the wheel of a Ferrari Testarossa rather than behind a desk staring at a PC monitor. But in the real world of law enforcement, information systems are providing more valuable assistance in narcotics investigations than the fastest cars or the leggiest blondes.

Unisys Corp. of Blue Bell, Pa., for example, is marketing two new offerings created by third-party software companies that specialize in drug-enforcement applications. The Computer Assisted Narcotics Enforcement System (CANE), from Allstar Knowledge Engineering, and the Multiple or Single Agency Information Center-Drug Enforcement (MOSAIC-DE), from Highland Technologies Inc., help agents analyze information from multiple investigations; expose associations between people, property and evidence; and provide leads that might otherwise be overlooked. Both CANE and MOSAIC-DE also allow law-enforcement officials to share information with other agencies.

CANE, which is currently being used with considerable success by the Huntsville, Ala., Police Department, helps develop leads and create cases by linking new data with existing information in the system. Investigators can record and analyze information relating to suspects, locations, evidence, surveillance reports and other relevant categories. CANE also helps manage narcotics units by analyzing officer productivity, calculating the cost of each case, and



monitoring the effectiveness of confidential informants.

MOSAIC-DE offers what Unisys calls "a complete investigative solution in a single package." It enables faster identification and location of suspects, access to information formerly stored in case folders and the identification of difficult-to-detect leads.

"As drug dealers become more and more sophisticated

in their operations, it becomes increasingly difficult for narcotics investigators to assemble the evidence required to make an arrest that results in a conviction," said Gary Franck, Unisys vice president of public-sector marketing. "Taking advantage of this state-of-the-art technology provides the law-enforcement community with a new weapon." ■

HIGH (TECH) FINANCE

Call your broker! Knight-Ridder Financial has unveiled a new version of its MoneyCenter application—and it will provide money professionals with direct, real-time control of fast-paced financial information. MoneyCenter for Windows combines the weight of Knight-Ridder information—such as news, analytics and quotes on financial instruments—with the flexibility of Microsoft's Windows. As a result, customers can run and view several programs and functions simultaneously. Your broker could monitor breaking news, play with figures on a spreadsheet, dial out to an external database and look at notes about your portfolio in seconds.

Traders, CFOs and other financial professionals can combine live quotes, charts and spreadsheets on a single screen or download information to a Lotus spreadsheet so as to grapple with information in their own personal style. MoneyCenter also comes with audible (or visual) market alarms that end users can set to go off when, for example, a quote exceeds a preset limit, or when select market-moving headlines are released over the wires. Customers can also incorporate in-house analytics and databases into MoneyCenter. Knight-Ridder sells the product to run on a Knight-Ridder LAN or on the customer's existing LAN. ■

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AIRPORT SECURITY

X-RATED X RAYS

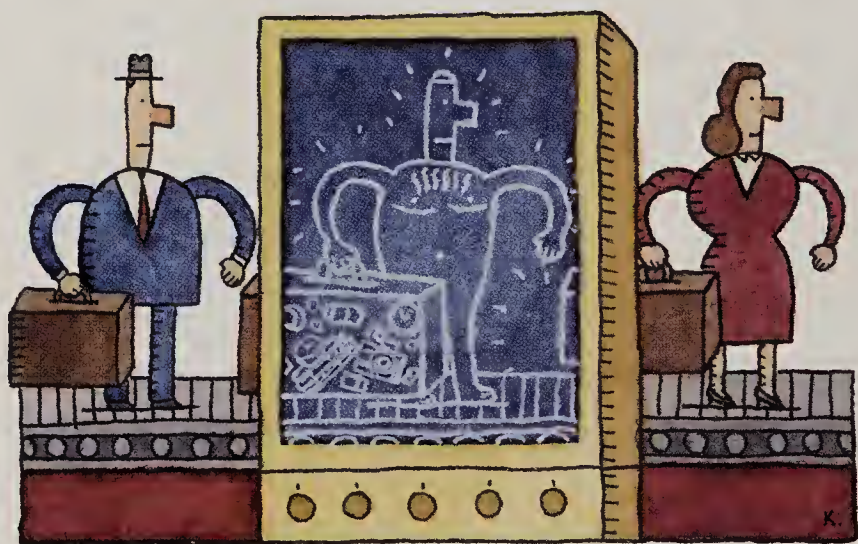
A technology that can see through clothes to reveal what people look like in the buff is one of two new X-ray security systems under scrutiny by the Federal Aviation Administration. Of course, the FAA envisions the technology—called backscat-

ter X ray—being used to peek into baggage and cargo rather than at passengers. Developed by American Science & Engineering in Cambridge, Mass., backscatter X ray will detect objects, such as drugs and explosives, usually missed by conventional X-ray systems, but it can also penetrate the veil of clothing to reveal—well, appendages.

The systems used today in airport security checks are limited. Concealed metal objects, such as guns, will absorb photons emitted in X-ray beams, betraying ghostly images of themselves. But when photons collide with dense organic materials, such as drugs or plastic explosives, they bounce away unpredictably, and the contraband passes through unseen. AS&E's Z technology systems, which are composed of conventional and backscatter detectors, were tested last summer at Boston's Logan International Airport. AS&E is currently developing an automatic de-

tection system that will search luggage and "tag" bags containing suspicious items—all without the assistance of a human operator.

The U.S. Customs Service already uses AS&E backscatter systems to search cargo for contraband (it also detects



smuggled currency), and rumor has it that backscatter systems are in place at the White House and at President Bush's home in Kennebunkport, Maine. Some prisons have begun to make enquiries.

The FAA is also interested in an explosives-detection system, developed by Vivid Technologies of Waltham, Mass.

Vivid's system marries snooping X rays with computer intelligence. In the Vivid system, "dual energy" X-ray scanners measure energy levels of the beam as it passes through various objects, sorting out metallic and organic materials.

But the key to the system is its intelligence. Essentially, a computer analyzes the infor-

mation picked up in X-ray scans, checking it against a library of data on material compositions. The computer electronically isolates and analyzes each item, decides which objects do not pass scrutiny, and provides human operators with an enhanced graphic representation of the bag's contents, with anything suspicious rendered in red. ■

CREDIT WHERE CREDIT IS DUE

Visa U.S.A. Inc., the San Francisco-based charge-card company, has launched a three-year back-office simplification project it says will save member institutions \$1.7 billion through 1997. One of the first phases of Backoffice 2000 is an electronic imaging system that will reduce from weeks to hours the time it takes to process consumer-transaction disputes.

Currently, when a purchaser contests a transaction, several weeks elapse while manual requests are made for transaction copies and pieces of paper plod through the mails. This labor-intensive process cuts into member banks' profitability and service reputation.

With the imaging system, requests for transaction copies can be filled in a matter of hours. The paper documents are electronically scanned into the system and transmitted from one location to another. Transmission itself takes less than five seconds, a six-fold increase over the capacity of similar technology just three years ago.

The Backoffice project is part of an even larger VisaNet 2000 program, a worldwide restructuring of Visa processing technology that includes enhancements to existing software and new fiber-optic networking technology. ■

MULTIMEDIA COVERAGE

For the emerging multimedia market, there's no place like home. Capabilities such as high-quality computer-generated video and sound are transforming home PCs into increasingly versatile tools for work, play and education. *MPC Magazine*, which debuts this month, will cover all aspects of the burgeoning technology set.

Published by International Data Group, the bi-monthly consumer magazine is targeted at the approximately 15 million people who use an IBM or similar PC for home or business computing, an audience that is being flooded with new options allowing them

to expand the utility of their home computers. Advanced sound and graphics boards and CD-ROM drives are already available, and such products as Microsoft's Windows for Multimedia Computing and Tandy's multimedia-equipped PC are increasing interest in the new technology set.

MPC will cover four primary categories: working, playing, learning and creating. A column called "Kids" will focus on the interaction among parents, children and computers.

Cover price for the new publication is \$3.95. For subscription information call 415 281-8650. ■

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Proceeding with Caution

Woe to those CIOs who commit their organizations to downsizing without planning for the management and technical issues that may complicate the process

BY MARC DODGE

Twenty-thousand years ago, gray wolves ranged over Europe and the Middle East. Scientists believe that all domestic breeds of dogs descended from these gray wolves. Man bred them selectively and methodically over many generations to create a more serviceable beast.

A good analogy can be made with downsizing. Downsizing is not a one-step process or a quick fix. Rather, it takes time and careful management, and the completed process produces an animal quite unlike the one it started out with.

The term downsizing has several meanings, and it is closely related to (and often used as a synonym for) the implementation of distributed computing and local area networks. For the purposes of this article, downsizing describes the process of replacing or supplementing main-frame and minicomputer hardware and software with PCs and LANs.

From a manager's perspective, the interesting thing about downsizing is its impact on the entire organization. Because the effects of distributing processing power are not restricted to the IS department, the issues such a move engenders are broad and complex. Choosing the appropriate technologies and enlisting top-management support are especially crucial.

Fortunately for the manager contemplating downsizing, the technical issues are settling down, and there are many safe options available. Communications products such as bridges, gateways

and routers are largely stable and dependable. Many of them are beginning to offer similar features and deliver comparable performance. In fact, the trend among vendors is to combine the functions of two or more in a single product. These products are necessary as IS begins building enterprise networks from the organization's separate LANs: the next logical step in the evolution of local area networks.

On the minus side, it is still difficult to distribute applications and software maintenance to numerous remote locations in a large heterogeneous network. Many current products are too slow for large data transfers, and others do not have the features to ensure proper central control of the process.

Fortunately, major vendors are correcting the problem, and this roadblock should disappear in the next year. And where the vendors fall short, some companies are taking up the slack. My organization, for example, has taken a commercial product that provides about 90 percent of its desired functionality and is adding the remaining 10 percent itself.

The most vexing and longstanding technical issue is convincing IS decision-makers that bigger does not necessarily mean better. Many application developers and IS managers cannot bring themselves to admit that a PC-based server costing \$15,000 can deliver the performance and features of a \$100,000 minicomputer. As a result, IS frequently ends up spending much more than it has to for hardware and software.

The battle over whether corporations should use LANs for downsizing is over; LANs won. But a new battle is being waged over the choice of server: minicomputer or high-powered PC. The minicomputer ven-



dors did a splendid job changing gears following the dramatic drop in sales of stand-alone minicomputer systems. Their new strategy is to tell IS decision-makers, "Yes, you should buy a LAN, but your server should be a minicomputer."

This strategy has worked very well with the unwary. Many companies removed large, expensive mainframes and minicomputers only to replace them with minicomputers running on a LAN. But these are only half measures. For anyone who cares about price/performance, minicomputers make very poor servers. The leading minicomputer vendors closely guard the technical specifications of their boxes. CIOs should do a little digging—look under the hood, so to speak. They will discover that the engine of some leading minis is not the equal of Intel-based PCs costing thousands of dollars less.

My organization considered a leading mini vendor for one of its downsizing projects. It was a beautiful box: big, with lots of lights, and practically oozing dependability. It also cost \$150,000. But when we ran benchmarks, the minicomputer proved consistently slower than an Intel '386, 25 MHz PC. We were puzzled: While we had thought the PC would be a better buy, we had not expected it to so thoroughly trounce the minicomputer.

After doing a little digging, we discovered that the minicomputer had a 16-bit architecture from top to bottom. When we "looked under the hood," we found an engine that was five years old.

In a recent study of minicomputer use at Fortune 1,000 firms, Forrester Research Inc., of Cambridge, Mass., found that 41 percent of the companies surveyed use minis as servers, while 86 percent of the same companies use PCs as servers. When asked about their intended use of minicomputers in the future, only 14 percent planned to increase their use. It seems that experience makes us wiser.

If ever top-management support is needed for an IS project, it is needed for downsizing. Because many down-

sizing projects involve placing more computing power in the hands of end users, their impact cuts across the entire organization. When IS stumbles along the way—and at some point it will stumble—it will have to be backed up. Otherwise, the project will fail, and the CIO will suffer personally.

IS shops are full of people with 10 or more years of experience working with mainframes and minicomputers

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and all the software and centralized-control features that go with them. These people will probably not welcome a project intended to break up their hegemony, no matter how beneficial the change or how much money it saves. This is just a fact of human nature, but it means that the changes necessitated by downsizing will not occur without broad management support.

Decentralization also creates the need for a structural realignment of IS along functional lines. For example, LAN personnel will spend more of their time testing and installing communications hardware and software. The introduction of gateways and bridges causes a huge gray area to develop between the areas of LANs and telecommunications, which must be addressed when the corporation begins building a wide area network.

But the most vexing management problem involves training and retrain-

ing. With downsizing come a new architecture, a new management philosophy and a new way of writing applications. This new world requires a completely different mind-set. Unfortunately, some people who have strong ties to the old world cannot or will not make the transition. For downsizing to be successful, therefore, new people must be seeded into the organization.

For example, the programming language C is much better than Cobol when it comes to writing distributed applications. The problem is that 90 percent of IS programmers know Cobol, while many do not know and have no interest in learning C or object-oriented programming. Such unwillingness to change makes critical the infusion of new blood.

In 1952 the passenger ship USS United States was launched. It was a technical marvel: On its maiden voyage it set a speed record for the trans-Atlantic crossing that stands today. This splendid vessel certainly was not too little, but it was, alas, too late. By 1952, airplanes were beginning to make regular crossings of the Atlantic, and in much less time than ocean liners. As a result, the USS United States was an economic failure and was withdrawn from service in 1971.

The business planners responsible for the ship took an old technology and continued to build and improve upon it without considering how the world was changing. We face the same dilemma today. Downsizing and distributed computing represent a fundamental change in the way IS and the core business are run. An important part of downsizing is understanding this and planning for the organizational as well as the technical issues that accompany it.

When we come to grips with these issues, we have an absolutely golden opportunity to run IS better and for less money. Recession or no recession, downsizing makes a lot of sense. ☐

Marc Dodge is the manager of LAN and PC systems for a Fortune 100 transportation company.

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In fact, the most difficult part may be describing how easy it is. But let's try. First you unplug the processor



cartridge. The one marked i386™SX, let's say. Then you plug in a new processor cartridge. The one marked i486™SX, let's say. There now, that wasn't so bad was it?

Want to try it again? Unplug the 486SX, and plug in a i486™ cartridge. Or a year or so when they come up with the next generation of processor technology, you can unplug your present cartridge and plug in that one.

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SELLING POINTS

BY MEGHAN O'LEARY

Although it is neither big nor complex, Calvert's executive information system is helping the retailer crack down on markdowns

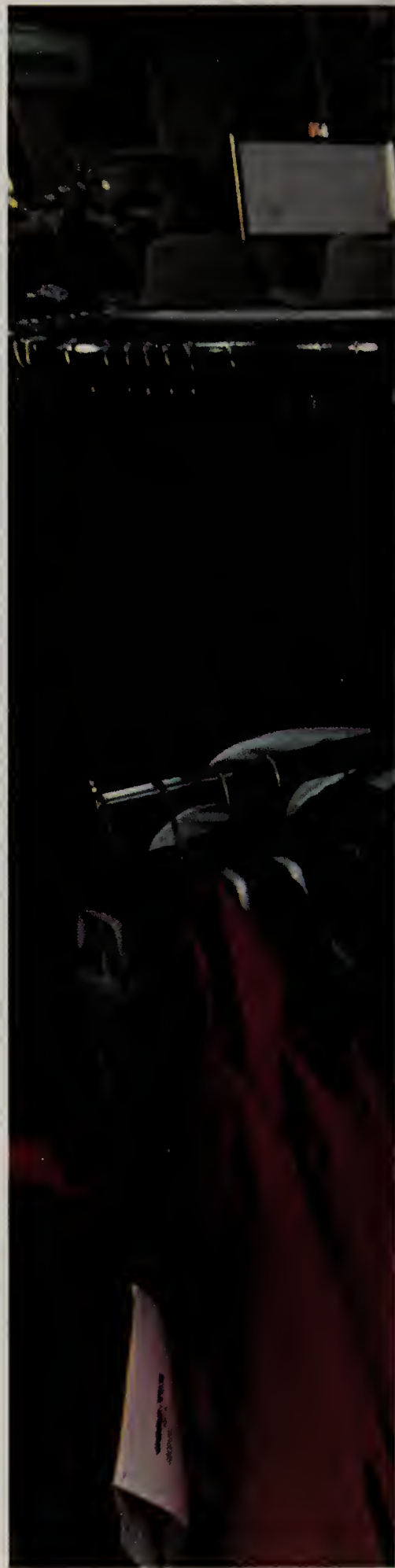
Overstocked in Outerwear," "Overplanned in Active-wear"—these contrived-sounding phrases refer to various dire merchandising situations that can lead to that most straightforward of consumer events, a sale. Regardless of how inviting the newspaper ads sound, however, a sale is not considered a blessed event in the retail industry. Sale items are those that didn't sell at the regular price. Sale items bring in smaller profits. Putting an item on sale is almost like giving it away, according to some.

Donald J. MacMillan and Richard J. Walczewski of Calvert's Inc., a three-store, off-price retailer based in Westborough, Mass., would like to have fewer unplanned sales, or markdowns, as they are known in the industry. With that in mind, they are using an executive information sys-

tem to turn the symptoms of those complex merchandising terms into simple, easily accessible warning signals.

Calvert's EIS use reflects the size and simplicity of its corporate environment. It is PC-based and has only two users: MacMillan, the company's treasurer and part owner, and Walczewski, the controller. Despite its small size, the system's influence extends across the company: Since bringing up the beta system last March, Calvert's has reduced its inventories and increased its profitability, even as sales have dropped slightly.

The system allows MacMillan and Walczewski to view and manipulate sales and inventory figures gathered via POS systems at each of Calvert's three stores, in Needham, Shrewsbury and Tewksbury, Mass. The



DONALD J. MacMILLAN (left) and **RICHARD J. WALCZEWSKI**: *The EIS has enhanced their decision-making ability.*



company's Wang VS65 polls each of the stores overnight. In the morning, an extract of the information is uploaded to the PC-based system where it can be manipulated without affecting the mainframe information.

Based on a shell developed by Information Resources Inc. of Newton, Mass., Calvert's EIS was customized for the retail industry by Sterling Software's Creative Data Systems Division in Cleveland. Calvert's has

worked with Sterling, a maker of minicomputer retailing software, for the last eight years. Sterling's value-added EIS product, SFR-Impact, is designed to work with its minicomputer-based Systems For Retailing

Information on sales and inventory levels for each store and major department, as well as tools with which to massage it, is available every day, instantaneously, at the touch of a button.

family of products.

Walczewski and MacMillan agree that the availability of information is the system's strongest selling point. MacMillan no longer has to request and wait for massive paper printouts from the IS department in order to analyze the company's performance. A year ago he would have had to wade through a number of printed reports in order to retrieve sales and inventory levels for each store and major department, doing calculations with a calculator and a scratch pad. Today that information, as well as tools with which to massage it, is available every day, instantaneously, at the touch of a button.

"We're a small organization," Walczewski said, "and we each wear a lot of different hats." MacMillan's business card reads "treasurer," but Walczewski points out that he is also an owner, chief executive and the merchandising manager for the chain. "And yet we're big enough that we have to watch out for the big competition that's around us," he said. "We need those information pieces to stay on top of things."

As the primary user of the system, MacMillan spends most of his time reviewing planned and actual store-level sales and those of the major departments for the previous business day. He keeps an eye out for trends that signal a problem and for major discrepancies between each store's planned and actual inventories and sales. Numbers in line with the company's plan flash in one highlighted color, and problem numbers flash in another.

When a problem requires closer examination, MacMillan can drill down to sales of specific items in spe-

cific stores. Less frequently, he looks at sales by smaller departments and at the stock ledger, which details the company's performance by gross profits.

"The system gives me controls that I can look at quickly and know where we're going," MacMillan said. "It makes you aware of the things that are happening. It doesn't tie into the balance sheet. This is a merchandising and sales tool. It is truly designed for the business of retailing."

The system relies, as does the business of retailing, on the activities of the buyers. Calvert's doesn't use E-mail—it would be overkill at such a small organization, says Walczewski—and the buyers don't use the EIS. Still, the system has a direct effect on them. When MacMillan sees a problem, he prints out the figures in graph form with a note to the buyer in charge and sends it via interoffice mail. "It brings the availability of that information down to another level," Walczewski said. "The comments are meaningful when they're coming from one of the senior executive officers who's got it right there in black and white." MacMillan also sends out notes for good performance.

Since purchases for the season are planned for the company and executed by store, this system also gives MacMillan a way to make sure buyers stick to plan. Communication with buyers, who are divided between Westborough and the store in Needham, has been spotlighted since the system's introduction, as the company has paid closer attention to maximizing full-price sales and minimizing markdowns of overstocked merchandise. "The buyers are not fi-

nancial people," Walczewski said. "They're more concerned with getting enough socks, shirts, ties, hats and underwear. Don's job is to watchdog them and to capsuleize what they're doing."

To say that Calvert's buyers were undisciplined prior to the installation of the EIS would be too harsh, both men agree, but they admit that one of the problems of their "family" company was a certain lack of structure. Overstocks and markdowns were more common in previous years because there was no way for MacMillan to see every move as it unfolded. "The fact that Don is now communicating to them and reacting to situations in a more immediate fashion is making them react in the marketplace, making them better buyers," Walczewski said.

Paper memos may seem an inefficient way of communicating information that the buyers could get electronically, but MacMillan firmly believes that the system is best used at the executive level. The information is an overview, he says, and is not detailed enough to be useful in the greater part of a buyer's job. In addition, Calvert's is a small company. A lot of streamlined, electronic messaging among a dozen people within a 20-mile radius would technically complicate a now simple process.

In addition to big-picture analysis, Calvert's EIS offers MacMillan the option of fiddling with projected figures and possible markdowns to make the best of an overstock or a poorly selling product. He can make all of the necessary calculations on the EIS without affecting the same information on the mainframe. "I can

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"The system gives me controls that I can look at quickly and know where we're going. This is a merchandising and sales tool. It is truly designed for the business of retailing." —Donald MacMillan

really ball things up, believe me," he admitted. "I told them I don't want to be able to write to anything. I want to inquire and that's all." No matter how many "what-ifs" he does in a day, the next morning he gets clean, correct numbers fresh from the mainframe.

The subject of MacMillan's calculations are most often markdowns—sale prices on items that aren't sell-

ing. Markdowns are a fact of life in retail, and yet they are the beast with two heads for most retailers. "I don't care who you are, you're going to have markdowns, but the fewer markdowns you have, the greater your margins are going to be," MacMillan said. "The whole key to the retail business is managing inventory. If you don't have enough, you're not going to optimize sales. If you have too much, you're going to lose margins. . . . This system helps us arrive at a balance." The purchasing process must be managed just as carefully in order to avoid markdowns as often as possible. The system has helped Calvert's to lower its inventories and its markdown rates "enormously" since last year, MacMillan said.

Lower inventories and higher sales margins have led to a 3 percent increase in profitability for the company during a devastating nationwide recession. (The company was down two points from its plan last year.) The profitability increase is all the more remarkable in light of the fact that the company's sales have fallen this year. "We could produce sales by giving our merchandise away; that's easy," Walczewski said. "But to produce profitable sales and to manage the inventory so you're *not* giving the merchandise away and you are adding to profitability—[that's] the ultimate goal."

While buyers are responsible for markdowns, the EIS gives MacMillan an overview of how each markdown will affect the entire organization, so his influence is critical. Still, the system's usefulness in making merchandising decisions has limits. "It will reinforce, a lot of times, our [feelings]

on what we're supposed to do," MacMillan said. "But the fact is, the eyeball is still an awfully good tool. And if I made all my decisions sitting right here at this desk, then we would run this company right into the ground real quick."

"At one point, we had the whole off-price market to ourselves," MacMillan said. Today Calvert's has to monitor itself more rigorously in order to keep up with the increased competition. "This system gives me the ability to look at things and ask the right question," he added.

Calvert's progress with the EIS has not been without problems. "In some cases we have reduced inventory levels below the optimum level this year, [resulting in items being out of stock]," MacMillan said. "And inventory levels came in from buyers below plan because they knew [that with this new system] I was going to be on their backs. So there are times when it has backfired."

Some stock-outs have resulted from new buying habits that Calvert's has adopted in order to optimize sales. "We used to have every size and color imaginable for every item, and it was a drawing card," Walczewski said. "But we ended up with overstock that we ended up giving away." The company has decided that it makes better business sense to keep its stock levels down and risk missing out on some sales of orange turtlenecks rather than risk losing profit margins on each item.

"It's the type of technology that, as a small business, will help us stay with the competition," Walczewski said. "We need the details as quickly as possible in order to react as quickly as possible." □

TECHNICAL PROFILE

Calvert's Inc. is a privately owned off-price retailer based in Westborough, Mass., with 1990 sales of \$35 million.

Large Systems: All automated activities originate at the company's Wang VS65 minicomputer, which is located in Westborough. Thirty Wang terminals (and four Wang PCs doing terminal emulation) are scattered throughout the company's three offices. The stores gather POS information via NCR registers linked to an NCR 2150 computer, which summarizes sales data before sending it to the Wang system.

Small Systems: Besides the Wang PCs, the company has two mail-order PCs (from HD Computer Systems) in its Westborough headquarters on which it runs its EIS.

Software: All of Calvert's software comes from Sterling Software's Creative Systems Division in Cleveland. This includes fully integrated modules for all facets of inventory control, sales, financials, merchandise planning and an Executive Information System.

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CHANGE MANAGEMENT

The more things change—in business, politics, technology—the more other things must change just to keep up. Unfortunately, change is often as painful as it is inescapable. Whether managers are mutating a process or metamorphosing an entire organization, they must remain constantly aware of how their actions will affect employees while balancing the need to take risks with the threat of incipient chaos. This month's STRATEGIC OUTLOOK offers a lesson in change management based on the experiences of three companies that emerged from the crucible triumphant.



Pains and Gains

If organizations want to survive, let alone flourish, they must adapt to new competitive realities. So it is not surprising that a science of change management is being defined, taking account of and aligning all aspects of organizational identity.

Page 36

Finding a New Niche

Having rescued it from the verge of collapse, Continental Bank Corp.'s new managers hope to radically reposition the institution. In the process, they have changed the bank's business, its organization and the way its employees work.

Page 40

Mending Their Ways

"Business change is like a guy who used to eat red meat and fat, has a heart attack and decides he has to change his eating habits or he won't live," according to Avery More, president and CEO of CompuCom Systems. CompuCom's own radical lifestyle change, in this case a complete re-vamping of its distribution process, helped the PC reseller to nearly double its revenue per employee.

Page 44

Reinventing the Workforce

Tellabs' Texas plant was such a quality nightmare that senior executives were considering closing it. Today the plant has reduced its cycle time from two weeks to five days, and it pumps out 10,000 printed circuit boards a week. Tellabs' managers accomplished this turnaround by redefining the role that people played in the company.

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CHANGE MANAGEMENT

PAINS AND GAINS

Change is the bitter medicine that organizations must take if they want to survive in a highly mutable business world. Learning to manage change can make the pill a little easier to swallow.



In the conference circuit, in the business press and at business schools, there is nothing quite so insistent as the drum beat in favor of the virtues of change, of reformation, of the ability to stop on a dime and do something new in response to suddenly altered competitive realities. Change now goes by such value-laden names as flexibility, nimbleness, adaptability, agility and transformation. Indeed, it is inarguable that organizations that can assume new shapes to fit new circumstances stand a far better chance of thriving than ones that are stuck and rigid. Closer to the truth for some companies is that unless they can change, they will perish.

But even foresightful organizations need to guard against becoming too cavalier about the rigors of change. It's worth remembering that organizational mutation comes down to new demands being made of individual people. And on that level, every change—no matter how worthwhile its consequences—is like a small death in which something familiar is left behind, the loss of which someone grieves. So the challenge lies not only in repositioning people and rearranging structures to exploit an opportunity (or recover from a disadvantage); it lies also in anticipating and controlling the costs of the transformation so that uncertainty and pain are mitigated to the point of being endurable.

In his newly published book *The Change*

Riders (Addison-Wesley), Gary D. Kissler, who heads Andersen Consulting's change-management services practice in London, gloomily declares that most executive managers are unprepared to deal with the complex processes of change. Of his own experience in the course of a chaotic downsizing effort (from which the book draws much of its authority), Kissler writes that "[m]anagers were having to learn a totally new discipline . . . that was not being taught in schools and probably couldn't be anyway. The lessons were being handed out in a harsh, ruthless, and explosive manner."

Unfortunately, Kissler believes, managers can count on little in the way of "expert" advice from the guru community. Too much of the guidance on change management comes from people who "have never had to confront these issues themselves and so are directing the battle from both a psychological and experiential disadvantage."

To extend Kissler's battle metaphor: Viewed from a distant hilltop, a battlefield strategy can seem quite orderly. The carnage only become evident closer to the fray. So it is with change management. What appears feasible in theory can fail in execution for reasons that seem inexplicable unless the process is seen up close.

With proximity comes insight into the interplay of human strengths and limitations—characters and egos—that can do more to determine the success or failure of a change effort than can its strategic underpinnings. Thus it isn't surprising that a new science of

change management is beginning to be defined, taking account of and aligning all aspects of organizational identity. Ralph H. Kilmann, a consultant and a professor of business administration at the Joseph M. Katz Graduate School of Business at the University of Pittsburgh, is among those who see a growing need to examine the characterological makeup of entire organizations.

"When you're trying to change and improve an organization, you realize that the people who . . . don't feel good about themselves tend to be most threatened," Kilmann said. "Those people who have higher levels of self-esteem and self-confidence are able to say, 'Well, that may have been the way it was in the past, but things are different now. Let's get on with it.'"

The same could be true of companies where the "collective ego" is downbeat, said Kilmann, "where the organization feels very down on itself, feels like it doesn't have the capacity to change. [That] really becomes part of the culture. And this is where you find people continuing to do things the old ways [and] resisting change at all costs."

But in companies where the collective ego "is on a much higher plane, there's a greater confidence about what they can do," said Kilmann. "I've been in some companies where the spirit is, 'We can do whatever we want to do.'"

And so Kilmann is investigating the intriguing possibility that organizational ego is, among other things, either an enabler of or a barrier to successful change. Can it be that organizations must first get their aggregate egos in order before embarking upon a program of nimbleness?

This month's "Strategic Outlook" focuses on the efforts of three organizations to implement fundamental changes. In figuring out our approach to the large subject of change management, we decided to address three areas: employee behavior, business processes and organizational positioning.

And since there is no teacher quite like the example of someone else's real-life struggle, we herewith present profiles of companies that have aimed at one or more of these three targets. CompuCom Systems, a Dallas-based PC reseller, dramatically revamped its distribution process, dismantling the boat rather than rocking it. At Tellabs Inc., an Illinois-based maker of telecommunications products, a self-professed quality nightmare has been transformed into a TQM exemplar by changing the roles people



play throughout the company. And at Chicago's Continental Bank Corp., a full-service organization teetering on the brink of collapse has been reborn as a specialized banker to big businesses and wealthy individuals.

None of our profile subjects undertook these exertions because their CEOs were enamored with the theories of Drucker, Peters, et al. In each case, the companies were faced with competitive triggers, ranging from serious to near-catastrophic.

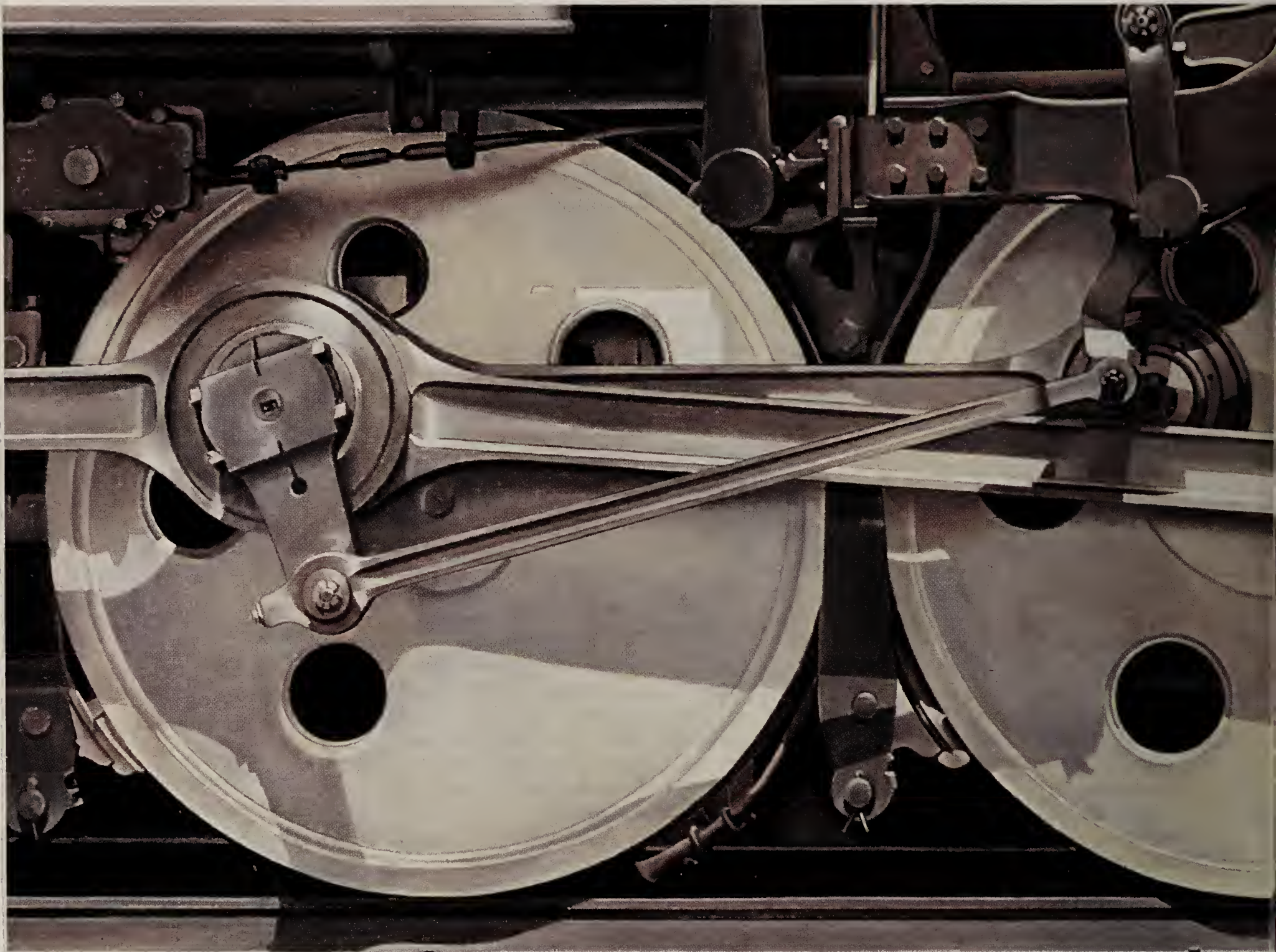
In all three cases, the pain of changing has begun to bear fruit. CompuCom's revenue per employee was \$330,000 three years ago; this year it will exceed \$600,000. Continental is in the process of shaping a quick-response banking organization that can adapt to sudden fluctuations in volume for particular products while achieving Japanese-style product-development cycles. Tellabs has taken an assembly process that formerly required 52 people and achieved the same production volumes with only seven people.

As each of the profiles suggests, change is a complex undertaking with a decidedly long-term payoff and many short-term aggravations and missteps. But as Tellabs' Scott Kollman observed, failure and frustration are as valuable to the change-management learning curve as success, and experimentation should be encouraged and rewarded. **CIO**

IT IS INARGUABLE that organizations that can assume new shapes to fit new circumstances stand a far better chance of thriving than ones that are stuck and rigid.

ILLUSTRATION BY MARY ANNE LLOYD

Systems integration.



The machinery is complicated

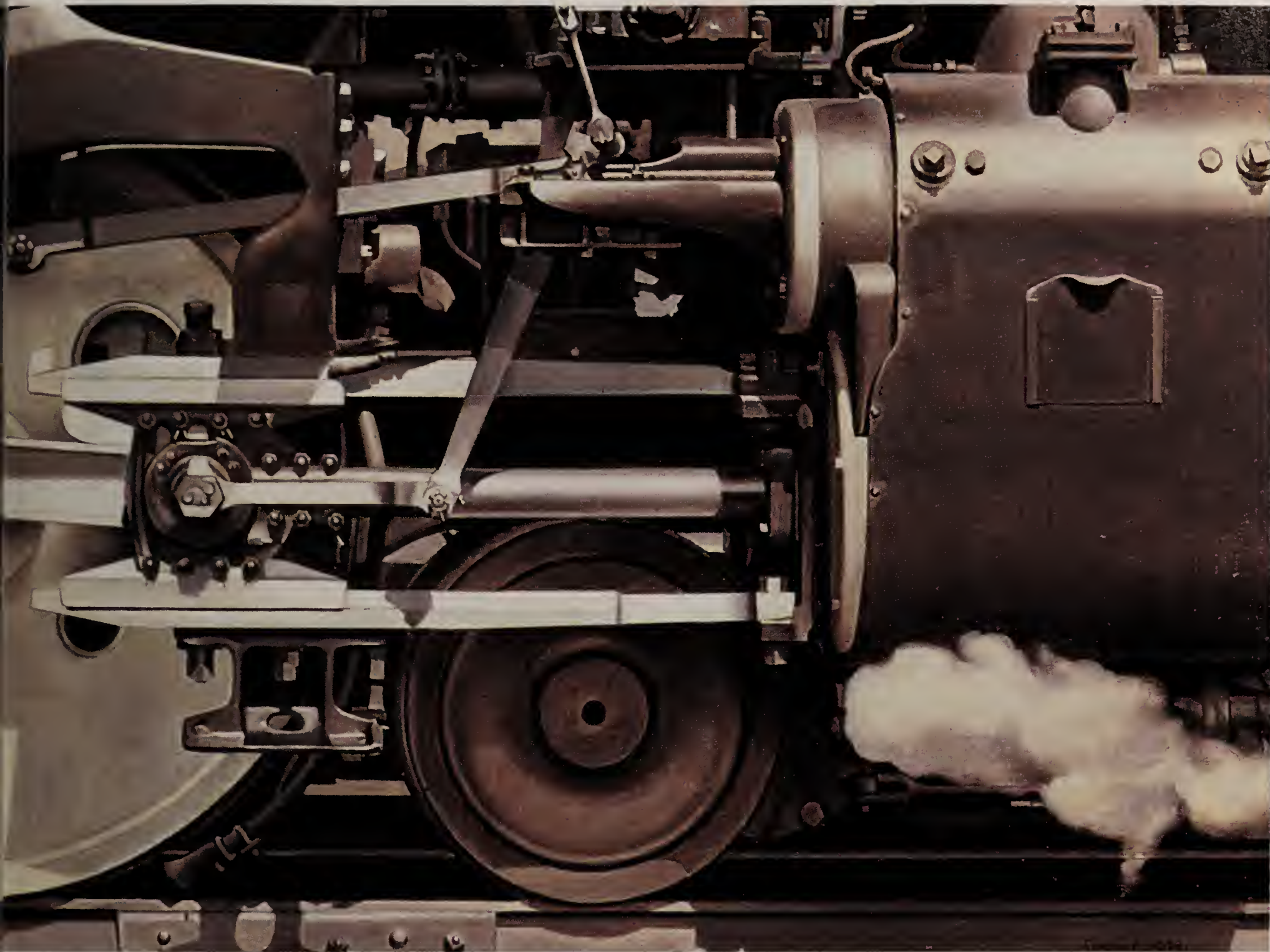
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CHANGE MANAGEMENT

PROFILE

FINDING A NEW NICHE

In its previous existence as a full-service bank, Continental Bank Corp. was at death's door. Today the institution is enjoying improved health in a slimmer, sleeker incarnation as a specialized banker to corporations and the wealthy.

BY THOMAS KIELY

Change greets customers the moment they walk through the doors to Chicago's Continental Bank Corp. In the lobby of what was once Continental Illinois Corp., a brigade of bank clerks used to stamp passbooks and cash checks. But Continental is out of that business. Now the clerks and teller windows are gone, and the space they once occupied is leased to an assortment of small retail stores.

In just over four years, Continental has transformed itself from a full-service bank to a specialized financial-services institution, primarily serving corporations and wealthy individuals. The bank's new managers are hoping to radically reposition the institution. In the process, they have changed the bank's business, its organization and the way its employees work.

Continental didn't have much choice. In 1984 the bank was on the verge of collapse, burdened with bad loans, walloping losses and an exodus of depositors. The Federal Deposit Insurance Corp. eventually pumped \$4.5 billion into Continental and became the bank's majority owner. The new owner hired a new chairman in 1987—former CitiBank Vice Chairman Thomas Theobald.

Theobald charted a rescue course for the

bloated, directionless bank soon after he moved from New York to Chicago. Given the bank's problems, the competition and the mounting recognition that the banking industry faced change, Theobald decided to cut through Continental's diversified thicket of business lines and hone in on the core business. Corporate customers, say Continental's present managers, had always been the bank's real base, anyway. And since specialization is the fashion in other industries, why not in banking, too?

Theobald sold off Continental's retail banking operations and shuttered some overseas offices. He pushed corporate financial strategy products, sailed the bank into foreign-exchange trading, formed an investment-banking unit and emphasized relationships, deal flows and the niceties of private banking for the very rich. He also slimmed the company down to about 5,000 employees, from the army of 12,000 employed a decade earlier.

But there have been fits and starts in pursuit of the grand plan. Continental took a beating in the securities-clearing business, entered and exited futures clearing, and decided to chase highly leveraged transactions with gusto just as that market deflated.

"The real world doesn't stand still while you sit there and artfully craft your little strategy," said Vice Chairman Richard



SNAPSHOT

Continental Bank Corp. was an institution on the verge of collapse. Then its new managers sold off its retail-banking operations and switched the emphasis to relationships, deal flows and the niceties of banking for corporations and the very rich. Now, with a staff reduced by more than half, Continental is embarking on outsourcing.

RICHARD HUBER (SEATED) AND JOHN GIGERICH: SPEED AND FLEXIBILITY ARE CRUCIAL.

Huber. "As it happened, just as the strategy was being crafted and implemented, the world that we live in—the financial-services world—was going through radical change."

Continental is shaping an organization that will cope more efficiently with the quickening pace of change, Huber said. How? By fusing the organization to its core competencies—which is the managerial mirror image, if you will, of the tightly focused business strategy. Huber explained that Continental needs "an organization that is much more scalable—that can deal with a doubling of the volume or a halving of the volume in a given product in a relatively short period of time."

Deal teams are at the heart of Continental's new business. The gaggle of competing bank-product departments has been replaced by a loose, cross-functional coalition of product specialists (in such areas as pri-

vate placements or financial risk) and relationship managers. The relationship manager is the primary bridge between the bank and a customer. But when the customer buys a product or a service, the deal might require the efforts of six specialists and 10 other backup bankers from various departments. The individuals assembled to complete the deal will flow into other teams, as the business demands.

The shelf life of sophisticated banking products (or new twists on old products) is very short, but they can be very profitable for the bank that pushes them to market ahead of competitors. Speed and flexibility are critical—factors compounded by the customer's mutable needs in changing business climates.

"We want to be in the position of the Japanese," Huber said, referring to the shorter product-development cycles of Japanese auto

CHANGE MANAGEMENT PROFILE

manufacturers compared to their U.S. competitors. "I've got a real obsession about the need to take a new idea [for a product], test it, tweak it, package it and get it out."

Ideally, deal teams are an efficient way to chase what's hot and quit what's not. Of course, continuous change can tax the stamina of bankers. Huber shrugs. "In today's banking world, people who [can't change] aren't going to be employed," he said. At Continental, they're asked to leave.

IS ran afoul of this need for responsiveness. Systems development is a discontinuous expense for a bank like Continental. Traditionally, if the bank needed a new system it would hire an army to deliver it. Two years later, much of that expensive army would have little to do. If, conversely, a bank decides to shave IS expenses by staffing the valleys and not the peaks, bankers will grow old waiting for new systems.

Instead Continental decided to exchange fixed IS costs for variable ones. In September the bank signed a preliminary outsourcing agreement with IBM. When the deal is completed in January, IBM will purchase and manage most of Continental's IT operations. (Ernst & Young, working with IBM, will handle software development and maintenance.) Nearly all of the bank's approximately 450 IT employees will be offered positions at Big Blue's newly formed outsourcing subsidiary, Integrated Systems Solutions Corp. Continental estimates that it will save \$100 million—or 20 percent of its IT costs—during the life of the 10-year contract.

Former CIO John Gigerich—who stepped down in the final weeks of outsourcing negotiations—had been one of the strongest proponents of outsourcing among Continental's top managers. The strategy had arisen, in part, out of his department's own efforts, in late 1989, to reshape itself to match the business strategy of the bank.

"The one fundamental about change that we all forget is that once you begin the process, things will be different," Gigerich said. "But it may not be what you thought it would be." He recalled the reaction many on his staff had to the news that their department was likely to be axed in favor of an outsourcing contract. "They asked, 'What did I do wrong?'" Gigerich said. "They wanted to work harder, do more. But there was nothing wrong with their performance. It was just—times changed." The bank's new strategy had outpaced what a traditional IS organization could provide.

DURING THE PAST year, Continental has outsourced its cafeteria, messenger service, building management and some of its corporate marketing operations. The bank caused a stir last spring when it outsourced its legal department, eliminating 130 jobs.

Huber knows that when his bank is running at full capacity, he will pay more for providers' services than he would if his IS shop were in-house. "But when I'm running at full capacity, I can afford to pay more. What I want to do is to run profitably when volume is at half or one-quarter capacity." He wants flexibility, access to experimental technologies, and the range of systems-development experience that IBM and Ernst & Young can provide. That's an expense the bank could never justify under its own roof.

Technology is not a core competency at the bank, Gigerich pointed out. Banking is. "I don't know of anybody who borrows money from Continental because our loan system posts payment better than anyone else," Gigerich said. While some bankers were aghast at the idea of ceding technology control to another firm, Gigerich countered that they had already outsourced technology. "They've outsourced it to me," he said. "The problem is, they've outsourced it to a guy who has limited resources and a limited ability to do what they need done. Isn't it better to outsource it to someone who has the resources to win the war?"

During the past year, Continental has outsourced its cafeteria, messenger service, building management and some of its corporate marketing operations. The bank caused a stir last spring when it outsourced its legal department to the firm of Mayer, Brown & Platt, eliminating 130 jobs.

Gigerich compares the strategy to the Japanese system of alliances. "Use best of breed, trust each other, and work across boundaries. In this country we build walls and dig moats." But as Continental managers clear their decks of all but core activities, they learn the joys and terrors of managing increasingly larger portfolios by contract.

Information systems will not be the last department to go. Huber said he has some other even more unorthodox outsourcing plans up his sleeve, but declined to name them. Given the extent of the outsourcing at Continental, employees in other departments are wondering if they are next.

"I suspect they *are* wondering," Gigerich said. "The people who are in the core competency know that [they are]. I think everyone else is trying to figure out how close they are to the core competency, and how they interface, and where they fit." Still, not every service that could be outsourced will be—much depends upon the availability, quality and cost of providers. **CIO**



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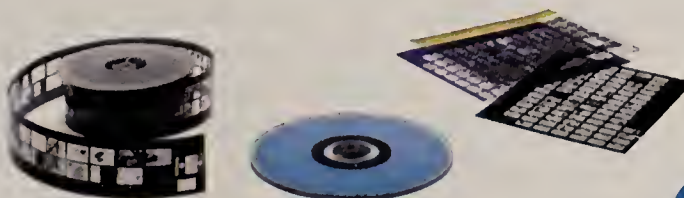
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CHANGE MANAGEMENT

PROFILE

MENDING THEIR WAYS

Plagued by ineffectiveness and inefficiency, PC reseller CompuCom had no choice but to revamp its core distribution process. As a result, the company not only survived—it prospered.

BY ALLAN E. ALTER

Business change is like a guy who used to eat red meat and fat, has a heart attack and decides he has to change his eating habits or he won't live," according to Avery More, president and CEO of CompuCom Systems. "Some businesses have to go through the equivalent of a heart attack, and this one was like that."

Today, after its recovery, CompuCom is one of the few hot growth companies left in the personal-computer reselling and retailing field. The Dallas-based company sells mostly to large corporate accounts. Thanks in part to acquisitions, CompuCom's revenues have grown from \$160 million in 1988 to \$343 million in 1990, said More, and should top \$700 million this year. At the same time, productivity has increased. In 1988, revenue per employee was \$330,000. This year, it will exceed \$600,000.

But when More joined CompuCom—first as a consultant in July 1988—the company was a melange of four computer resellers: CompuShop—a money-losing business sold off by Bell Atlantic—plus three smaller firms. "The organization had tremendous ineffectiveness and inefficiency," said More. "Something dramatic had to be done. We had to look at basic business processes and fix them. Distribution was the core process."

For CompuCom, distribution means moving products from vendors to customers. Prior to the company's transformation, products made two stops along the way: at a CompuCom distribution center and a local CompuCom "branch." "That process took a minimum of five to seven working days," said More. The new management wanted to improve service, offer next-day delivery to customers, eliminate shipping errors, cut inventory costs and attain economies of scale.

The solution More presented to CompuCom's directors in September 1988 included this seemingly simple advice: Cut the number of stops from two to one. Ship directly from the distribution center to the customer. And build an information system to efficiently manage and track the process.

But More's solution was greeted with skepticism by his board of directors and his employees and customers.

Convincing the directors was the less difficult part. "They were putting together four companies and had to change to a new way of doing business anyway." Likewise, getting support from top executives was relatively easy. More became president and put his handpicked CIO, Morti M. Tenenhaus, in charge of operations and the distribution center.

Convincing CompuCom's branch, sales, administrative and technical people was tougher. "They were used to doing things one way. Convincing them this would work,



SNAPSHOT

CompuCom Systems started out as an inefficient melange of four computer resellers, with an especially clunky distribution process. Achieving the goals of improved service, next-day delivery, zero shipping errors and reduced inventory costs necessitated setting up an entirely new process, creating an information system to manage it and winning over the skeptics.

AVERY MORE: "SOMETHING DRAMATIC HAD TO BE DONE."

and that customer service would not suffer but actually improve, was not a trivial thing," said More. Nor were customers easily persuaded that the speed and accuracy of their orders would improve despite the withdrawal of local inventory.

The hard work of setting up the new distribution process, creating an information system to manage it and winning over the skeptics began after More's plan was approved. As a consultant, More spent the fall of 1988 fleshing out his plan and meeting with and marketing his ideas to the company's managers. In January 1989, when he came aboard as president, he brought in his management team, including Tenenhaus. And in February he started building the new distribution system.

At that time CompuCom relied on mini-computers for its internal systems. It had three IBM System/36s and had just invested \$500,000 in a Hewlett-Packard 3000 and

software. But More determined that the demands of the new system would exceed the capabilities of the minis. Besides, he was micro-minded. "We wanted to tell customers we wear our own shoes," said More. He was certain—and eager to prove—that a network of micros was capable of handling both present and future capacity.

A rapid-development effort went on for six months, through July 1989. Techniques included joint application design sessions with users, with prototype screens and functions for them to try out. "It's helpful for an IS person in Dallas to know how customers want the data," said Tenenhaus. These techniques helped users buy into the system.

Meanwhile, More began to centralize the physical part of the distribution process. During March and April, the four original companies' distribution centers were shut down and replaced with a single center in Dallas. The branches did not escape the

PHOTO BY DAVID BUFFINGTON

CHANGE MANAGEMENT PROFILE

trauma: Their inventory was shipped to Dallas, and their electronic-order-entry terminals were unplugged.

This brought instant simplicity and centralization, but at a price. It forced CompuCom to rely on expensive overnight air-freight services to deliver goods to customers. Salespeople had to go back to writing purchase orders by hand. This phase plunged much of the CompuCom organization into fear and exhaustion.

David I. Robinson, CompuCom's director of distribution and order processing, was an accounting manager at the time. He recalled that panicky branch personnel, suddenly without inventory on hand, rang his phone off the hook. "We were fielding calls asking, 'When will we see the product?' and 'How will I know it got there?'"

More acknowledges the difficulties of making good on the next-day promise even before the new system was in place. But effective next-day delivery, not efficiency, was his goal at the time, he said. CompuCom had to "make sure it was there the next day. That was critical to getting credibility for this new way of doing business."

In July, a final prototype was developed and installed. This system tracked order status, inventory and "fill rates" (how many orders were filled in an accurate and timely way). While this first version of the system ran on the IBM System/36, along with existing distribution-center applications, PCs performed some of the processing and provided the "windows" into the system.

Glitches marred the new system at first. Robinson recalled a 15-to-30-day period after installation marked by interruptions. "Making sure invoices came out correctly, with proper taxation, caused one of our bigger delays," said Robinson. "For two weeks we didn't generate any invoices."

But soon these bugs were ironed out, and new functions were added. Software modules were ported to Unix and adjusted for use with a relational database. This enabled conversion to the client/server architecture More had envisioned, using Compaq SystemPros as hosts. The last minicomputers were unplugged by January 1991.

Executives had to assure skeptical employees that they could count on the new system—and not just because of the early bugs. The branches hadn't trusted their old order-entry system, said More and Tenenhaus. This mistrust caused them to nag distribution-center staff, hoard inventory, keep

MORE WAS certain—and eager to prove—that a network of micros was capable of handling both present and future capacity.

private databases and triple-order merchandise to make sure one order was correct. The new system didn't immediately resolve the trust problem. "When the people in the branches had the inventory in their hands, they *knew* the merchandise was here," said More. "Now we gave them electronic blips on the CRT, saying 'Quantity on Hand: 76.' It took a leap of faith in their mind to say this '76' represents real merchandise."

To build confidence, CompuCom's regional vice presidents, branch managers and top-performing salespeople were flown to Dallas and given tours of the warehouse and information center. "We brought them to a terminal, said, 'Pick an item, and see what quantity is listed,' and then let them go to the back and count it. We let them pick one item, and then another and another. To convert nonbelievers, we had to give them physical proof."

The system's tracking and measurement features also built confidence, said More. Nervous salespeople and customers could track the status of orders throughout the distribution pipeline. The fill-rate tracking system provided proof that CompuCom was actually delivering products on time. Information like this provides peace of mind to customers, makes salespeople more confident and persuasive, and bolsters the company's credibility, said More.

Furthermore, the system's builders remembered that good systems require accurate data. "Reason codes" and incentives helped to improve accuracy and performance. When a delivery goes awry, the reason for the snafu is tracked to its source, then recorded in the system under a reason code. During the ramp up, cash incentives under a formal pay-for-performance program were given to employees who lowered their error rates, including errors due to adding wrong information to the system.

More regards the trips to Dallas and the order-tracking and measurement systems as necessary investments that have more than been recouped. "It's amazing the amount of energy and effort people will exert, only because they did not trust the computer system." Directing his employees' energies from wasteful to productive uses, he said, helps account for the company's high revenue-per-employee rates. "The inability to address this very simple business process," he added, is in large part the reason so many of his competitors were forced to merge out of existence. **CIO**

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CHANGE MANAGEMENT

PROFILE

REINVENTING THE WORKFORCE

When Tellabs Inc. decided to apply just-in-time processes and total quality control at its manufacturing plant in Austin, Texas, it had to fundamentally reshape the roles of its employees

BY THOMAS KIELY

Things don't stay the same for very long at Tellabs Inc.'s manufacturing plant near Austin, Texas. In fact, the Lone Star operation of the \$200 million telecommunications-products company is a veritable laboratory for change. The factory floor has been significantly redesigned three times in three years, work processes are constantly evolving, and the company's performance mechanisms—governing what is expected of Tellabs' employees and how they are compensated for their work—are a portrait of trial and error.

Tellabs executives proclaim that people are the heart and lungs of the company. Four years ago they put their efforts where their mouths were with impressive results—though not without inflicting anguish and confusion on many employees and forcing others out the door. The company, headquartered in Lisle, Ill., with manufacturing operations in Lisle, Texas and Ireland, embraced the ideology of just-in-time (JIT) processes and total quality control (TQC).

While both the Illinois and Texas plants were reshaped, the change has been particularly dramatic in Texas. At the time, the Texas plant was a quality nightmare. Em-

ployees recall red-faced customers screaming at plant managers. The company's senior executives considered closing the site, but instead chose to give JIT a chance. Today the plant (which accounts for 54 percent of Tellabs' revenues) has reduced its cycle time from two weeks to five days. It pumps out 10,000 printed circuit boards a week, and 98 percent of them are free of defects.

The Texas-based management team did not accomplish this turnaround with nifty new information systems or slash-and-burn tactics. They did it by redefining the role that people played in the company.

In 1987, following some initial pilot projects, managers at the Lisle headquarters began to make sweeping changes at both of the company's U.S. manufacturing plants. The functional hierarchies on the factory floor were scrapped. Fifty-two job titles (organized into seven levels) were compressed into one. The role of the supervisor was redefined, and supervisors were asked to reapply for the new positions. A few were not rehired as supervisors but were reassigned to assembly jobs; others left.

Tellabs' JIT team, headed by Director of Manufacturing Grace Pastiak, began with the notion that employees must be empowered to identify and solve problems in the workplace. "JIT exposes problems," she

SNAPSHOT

Four years ago, the Texas-based manufacturing plant of Tellabs Inc., a \$200 million telecommunications-products company, was such a quality nightmare that the company's senior management considered closing the site. Instead they embraced the ideology of just-in-time processes and total quality control, and the plant has become a veritable laboratory for change.



ALAN SIEBENALER BEGAN BY BUILDING MANAGERS' CONFIDENCE AND SENSE OF PURPOSE.

said. "Total quality control solves them." The functional assembly line was replaced by cross-functional work cells—teams of workers responsible for products.

But as Lisle changed, Texas continued to flounder. "We just didn't have the systems to support empowerment," recalled Wanda Reetz, divisional manager of human resources at the Texas facility. "We had some initial training, but we didn't follow it up." Empowered employees discovered that they could identify problems but lacked the skills to solve them. It was a people problem.

Managers at the Texas site were another people problem. "They had lost their confidence," recalled Alan Siebenaler, a Tellabs executive who took over the operation in 1988. (Siebenaler is now back in Lisle as director of product development for a new

line.) While Siebenaler had permission to replace the Texas management team, he decided to keep them on. "Those people were not at fault," he said. "There wasn't any real leadership there. The changes they had been asked to make weren't clear to them."

To build confidence and a sense of purpose, Siebenaler held long discussions with his managers about the differences between traditional manufacturing and JIT. Out of those discussions, the Texas group decided to chart their own JIT course—one that differed in some respects from Lisle's directives. The work processes at Texas weren't like those at Lisle, they decided; Texas handled more parts and products. They replaced the work cells with a "more disciplined, more proscriptive approach," Siebenaler said. "Texas needed a form to

PHOTO BY ANDY GOODWIN

CHANGE MANAGEMENT

PROFILE

use with the content [of JIT]."

Assembly employees were reorganized back into stages in a process, such as hand insertion, soldering and so on. But supervisors (who act like team coaches) were still responsible for the complete assembly of products; they supervised what was now a distributed workgroup, from initial inspection through final boxing.

Tellabs also began to experiment with flexible work programs, phasing in a skill-based compensation program to encourage employees to learn to perform additional jobs. Workers who are certified to perform a variety of skills can move among stages of the assembly process as needed. During 1989 and 1990, Texas adapted the corporate program to meet local needs. The Texas crew wanted tighter management control over flexibility, and also sought ways to bridge the gap between gung-ho employees and less flexible ones.

During these two years, managers and engineers at the Texas plant documented every part and each step required to assemble each product. All this was rendered graphically into work directions—to compensate for workforce literacy problems and to abet flexibility. Quality checks were integrated into nearly every step of the process, so that workers could actually see their colleagues up the line double-checking their work. The work floor was reorganized "visually," so that employees and supervisors could see the progress of a product on its way to the loading dock. This also allowed them to keep an eye on the traffic of components, which have been reduced to a two-day supply in most instances. The stockroom shrank to 25 percent of its former size. The company's goal is to build to order.

Much of this evolved through trial and error. Texas retooled its compensation program when flexibility began to undermine quality. Some workers quickly learned new skills—and earned higher pay. But some jobs proved to be more attractive than others to ambitious workers; these jobs quickly became oversubscribed.

Other workers proved to be inflexible. Rotations needed better controls. Training and certification were expensive. Moreover, managers soon discovered that experienced hands knew just how hard to push a component onto the board; flexible new workers lacked the touch that comes from experience, driving up the plant's defect rate. Managers clamped down and are about to in-

THE TEXAS-BASED management team did not accomplish this turnaround by implementing nifty new information systems or by inflicting slash-and-burn tactics. They did it by redefining the role that people played in the company.

troduce a new iteration of the plan.

Workfloor processes aren't static, either. Managers, engineers and factory-floor employees constantly seek to change the way the work flows. Some changes are small, such as altering the way products are boxed. Others are dramatic. The Texas facility recently absorbed the operations of the Puerto Rican plant, which was closed. It managed the move in just two weeks—slimming down the assembly from 52 employees to seven while maintaining the same production volumes. At the same time, managers again redesigned a portion of the plant's layout.

Managers swapped hats, too. "I must have reorganized the management team half a dozen times," said Siebenaler. Assembly employees might report to one manager one month, another manager the next.

Continuous change has taken its toll, however. Some employees on the line think that the managers are whacked—or indecisive. Turnaround rates at the Texas facility have run at an average of 30 percent for the last three years. Some workers freely admit that flexibility isn't for them; they long for stability. As one assembly worker put it: "The stress levels around here are very high."

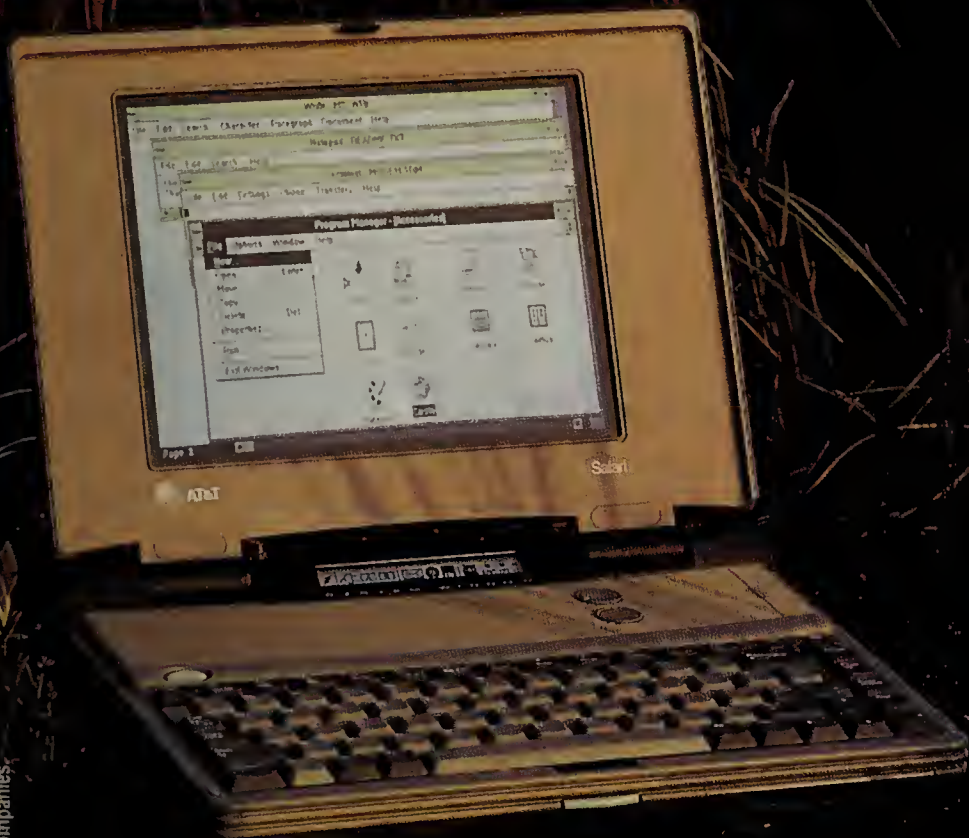
Workers who can't abide change face a bleak future at Tellabs. With continued turnover, the sensibility of those who enjoy variety is likely to dominate the culture of the factory floor over time. Many elderly workers will feel increasingly estranged. Worse, said Pastiak, "as [an inflexible worker's] skill becomes outdated, so does the person."

More change is on the horizon. Tellabs has begun to use employee teams to identify and solve problems. And the company is merging the team approach with statistical process control (to quantitatively foresee problems before they develop) as a way to hone the benefits of employee involvement. Down the road, Tellabs is already planning for self-managed teams.

Scott Kollman, who is Siebenaler's replacement as director of operations for the Texas facility, believes that risk and experimentation are fundamental to continuous change. "That old standard, 'If it ain't broke don't fix it,' doesn't work down here," he said. While some experiments will go sour, Kollman acknowledged, failure is as much a part of the learning curve as success. And the company does not penalize employees for failure; to do so would only stifle risk-taking, and more creative ideas.

That's an attitude born of confidence. 

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Since the dawn of the information age, most executives have stayed conspicuously away from computers. According to the conventional wisdom, this is because executives don't want to type and because computers aren't easy to use. But these excuses mask a more pertinent reason. Even if they are convinced of computers' strategic value, many executives still view strategic applications as pertaining to administrative aspects of the business.

Because of this perspective, executives tend not to see computers as tools for their personal use. Most have no concept of the power of the computer as a leadership tool. However, there are exceptions. My recent book, Leadership and the Computer (Prima Publishing, 1991), profiles 16 CEOs, presidents and chairmen of organizations who find tools such as spreadsheets, word processing, commitment-tracking systems, electronic mail and personal databases to be tremendously useful in helping them achieve their personal and corporate objectives. What follows is a glimpse into three of the 16 executive profiles, excerpted and condensed from the book.

POWER USERS

THOMAS STEPHENS

President and CEO, Manville Corp.

In 1982, things at Manville Corp. looked pretty bleak. Manville, a massive building-supply concern that formerly produced asbestos, faced thousands of lawsuits from people claiming damages caused by its asbestos products. The only hope for saving the company was to reorganize under the protection of Chapter 11. At the same time that the company declared bankruptcy, it began negotiations to set up a trust fund to compensate the asbestos victims.

Three years later, the negotiations were at a standstill. The often acrimonious sessions involved eight constituencies—present claimants, future claimants, commercial creditors, trade creditors, property claimants, codefendants, the government and the insurance companies—many of them with conflicting interests.

Dealing with so many constituencies in such an emotionally charged climate complicated the negotiating process. And not all of the claimants were financially astute. Very complex problems had to be recast in simple,

Chief executives who know their way around computer systems testify to the empowering virtues of hands-on use

BY MARY E. BOONE

clear formats. Effective communication through crisp, logical presentations was key.

To prepare, Stephens worked on spreadsheets and created his own charts and slides on his personal computer. He wanted to design his own presentations because "if I prepare [a presentation] myself, I'm comfortable with it, and it's going to be of better quality than if I just run into a room with something somebody else prepared for me. [With the spreadsheet] I can look at the information from more perspectives. It's become an extension of my brain. It relieves me of the drudgery of the

work and simultaneously expands my ability to do the work better."

His personal investment paid off. Armed with a tenacious negotiating style and clear, logical presentations, Stephens managed to get all factions to agree on a reorganization plan, which was approved by the bankruptcy court in December 1986.

During the negotiation process, the company was on its knees, Stephens recalls. "We'd been in bankruptcy for a number of years. We had come through a number of recessions. We didn't have a clear business plan. We didn't know whether the company was going to be alive in the short term." To get this paralyzed company going again, Stephens had to develop and gain approval of a series of business initiatives.

But he couldn't act alone. After the company went into bankruptcy, the board of directors had undergone an overhaul. For Stephens, building a relationship with the new board was fundamental. His use of spreadsheets and graphics for board presentations was particularly critical to building his credibility at the outset.

Stephens worked with the board on strategy and with his staff on the



THOMAS STEPHENS: *Computers are a way of expanding your mental ability.*

details of a business plan, the purpose of which was to rally the organization around a fresh vision and remotivate a dejected workforce.

But gaining participation in business planning from jaded, skeptical employees was not easy. Stephens encouraged communication with a quarterly letter, mailed to employees' homes, asking for their thoughts and concerns. He guaranteed them a personal reply within 10 days.

The mail started pouring in. To handle it, Stephens set up a system using his word processor. Every Sunday he answered letters for two

hours. With the support of the board and a business plan in hand, Stephens was ready to present the shareholders with a clear path to recovery. In the second quarter of 1989, he held the first "annual" shareholders' meeting in seven years.

Stephens wrote his speech on his PC. "I guess I never sweated over words any more than on that speech. It was on a floppy disk, so I'd go home and change words and add phrases, and we'd come back and talk about it. By editing on the screen, I put more of myself into the speech."

While the computer has helped

Stephens analyze, communicate and convince, he is most interested in its creative possibilities. "You've got to see this as a way of expanding your mental ability. The mind has got just so much BTU power. You can use it to discipline and organize, or let it flow and be creative."

Stephens believes he wouldn't be as successful without the computer. "It's like taking John Elway aside before a game and telling him, 'You can't throw any passes to the right side of the football field.' He may still win the game, but you've taken away a powerful part of his portfolio."

PHOTO BY BILL FARRELL



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RONALD COMPTON

President, Aetna Life & Casualty

Trying to make large insurance corporations responsive to the needs of a dynamic market is like putting an ocean liner through a slalom course. Ronald Compton, president of Aetna Life & Casualty, has employed some ingenious measures to achieve this elusive objective. Not only does he encourage Aetna to exploit new technologies, but he also uses computers himself to fulfill his leadership goals.

Compton developed the Aetna Management Process (AMP) to define Aetna's corporate objectives and to help people identify and focus on the critical aspects of their jobs and align their own objectives with those of the organization. To encourage and spread the AMP, Compton needed two primary information systems: a database to provide feedback on critical success factors and an expert system to guide people through the AMP.

The database allows users to track the critical success factors defined by the AMP. It contains numerical data, interpretation of the data and a progress-tracking system for key company issues. Sharing this information helps Compton focus people on issues of importance. The AMP message is currently disseminated to Aetna's 45,000 employees through workshops, but an expert system currently under development will help it reach many more people with much greater speed.

Compton has identified three areas critical to his success: knowing what he wants from people, communicating clearly and managing his time.

"One of the ways that I think through what I want is by preparing option papers," says Compton. "I think up all the possible options to an issue—list the pros and cons. It helps me figure out a course of action." When putting together option papers (as well as speeches and presentations), Compton uses a word processor. "I use the word processor the way some people use a pencil.

RONALD COMPTON:
Technology enables the development of flexibility and responsiveness.

It's a creative tool. I'll use it to help support me while I think through a problem." He also uses graphics packages and spreadsheets, depending upon the issue he is exploring.

Electronic mail extends Compton's influence and connections far beyond the executive suite. "Most of my electronic mail use is with my direct reports and other people I work closely with. . . . But other people send me messages too. I'll give a speech or a talk somewhere, and the next day I'll have three or four messages from people I've never heard of. I always answer them. Every time somebody who doesn't know me gets a message back, a thank-you or something, I'll bet 300 other people will hear about that.

"A strong feature of E-mail is that you get to it when you want to get to it. It takes pressure off of me. It allows for a greater focus and greater concentration on the job. And for communicating, it's quicker and it's less disruptive."

Compton has begun to effect the sweeping change necessary for a large company to compete in a fast-paced financial-services industry. "Technology is a major element of the development of [flexibility and responsiveness]," says Compton. "The tools I personally use help me develop those characteristics further—both for myself and for the corporation."

ROBERT WALLACE

Former President, Phillips 66

The year was 1984. T. Boone Pickens moved stealthily and mercilessly, with Phillips Petroleum Co. his target. A second attack came only three months later, when Carl Icahn made a hostile offer. The battles left a weary and weak survivor. Throughout, Robert Wallace had been heading up the organization's Petro-

ROBERT WALLACE:
To alter the effectiveness of the organization, you need a good information system.

leum Products and Chemicals Group.

The company emerged in shaky condition. "[We were] one step from Chapter 11," says Wallace. "All of the market had written us off, our stock had plummeted, and all of the analysts were predicting either collapse or ultimate takeover."

Wallace developed his vision for the company's recovery around a primary goal: streamlining operations and leveraging staff groups. He recognized that information systems might provide the tools to pull the company back together, envisioning a system that would provide real-time information to all levels of the corporation, including executives.

Wallace expected that such a system would cause a tremendous cultural shift toward empowerment of frontline management. "The true power of this concept was that it provided an immediate feedback mechanism to the operating person making the decision." And in this new, decentralized culture, top management "would be able to look into the system and see the problems much earlier. That would relieve their concern about [management] controls."

Implementation began with the top executives. Wallace found that the information on the computer put the executives in much closer touch with the business. They then began to explore ways of using the computer to stay close to their customers, sharing general business intelligence with them and connecting some to their electronic-mail system. "[When] I picked up on a useful piece of information, I could just send it to customers informally through electronic mail. Because it was so easy, I communicated with them more often."

The free flow of information between staff and operating personnel had a considerable impact as well. "When staff groups are making the decisions, it's impossible to maximize the value of information. Staff people are not in a position to understand



the ramifications of a business decision as well as operating people, [who are] running the business on a day-to-day basis."

This sharing of information unified the company in a way that no motivational speeches or tactics could. Everyone became aware of operations upstream and downstream of their own. "People all over the company started looking at the whole row differently. There was a total change in how they thought—first of themselves, but more importantly of their role with respect to the others."

"[Phillips] became an overnight success story," Wallace said. "It was beyond even my wildest expectations. I have seen our system increase the profitability of Phillips Petroleum Co. by \$25 to \$40 million a year in a matter of weeks!"

As the company started to solidify and return to profitability, Wallace shifted his attention to setting the strategic direction for the new Phillips 66. To this end, he wanted to be well-informed about both internal and external events.

The first thing Wallace did every day was to check out the external databases on his system; these included information on trade associations and congressional activities. "[Then] I'd pop into the business reporting systems—not archived data, but the actual transactions of the business. I'd quickly scan such things as marketing volumes. If I saw something screwy, I'd pop into individual sections, but [if] everything checked out . . . I'd move on."

Wallace summarized the importance of IS to leadership: "If the drive of the '90s is survival and the fundamental drive for executives is optimizing the effectiveness of the organization, I don't care whether you're using Peter Drucker's theories or [William] Ouchi's, if you don't have a good information system, you haven't got a chance of altering the effectiveness of the organization. Not a chance." ☐

Mary E. Boone is a partner heading the EIS consulting practice for NDMA Inc. in Ridgefield, Conn.

Imaging in the Mainstream

An emerging class of sophisticated tools is helping electronic imaging work its way into the heart of organizational computing

BY SCOTT WALLACE

Just about every segment of the computer industry has experienced its ups and downs in the past year, with downs predominating. Competition is up; sales are down. Organizational restructurings are up; profitability is down. Hopes are up; expectations are down. Users, vendors and analysts have a uniform assessment of the state of the industry, and that assessment is gloomy. But despite all the clouds, there's one parade the rains have missed entirely. Electronic imaging has had only clear skies and fair weather. For imaging, the sun is shining, the crowds that line the sidewalks are getting larger, and the bands just keep playing.

One reason is that over the past year, electronic imaging has completed its transition from a leading-edge, integration-intense technology to the

mainstream of computing. Coincident with this transition is the emergence of a new class of automated design and development tools—applied initially to imaging applications—that focus on an organization's operations. Like imaging itself, these tools are expected to find a home in an enterprise's information technology armament.

The major computer manufacturers not only acknowledge the mainstream role of electronic imaging; they now support it as well. "DEC, IBM and Wang are in the market in a big way, with particular emphasis on IBM," said Michael K. Howard, program director of office information systems for the Gartner Group in Stamford, Conn. "IBM is the epicenter for the market at this point—not necessarily because they have the best products, but because people now know that the largest computer company in the world is going into imaging."

Underpinning imaging's growing acceptance is the fact that it has an integrating effect on an organization's existing information technology—perhaps more than any technical development since the local area network. In the past, an organization's information was online only if it was keyed into or generated by a computer system. Now information and materials from diverse, non-computer sources are being scanned in, faxed in, stored, retrieved, transmitted, modified and printed out. As a result, a far greater percentage of the information an enterprise uses can be found online and made broadly available to enhance operations.

Imaging not only supports new functions, it increases the utility and value of existing systems by bridging the gaps between them. This contrasts with the early days, when imaging systems were widely regard-

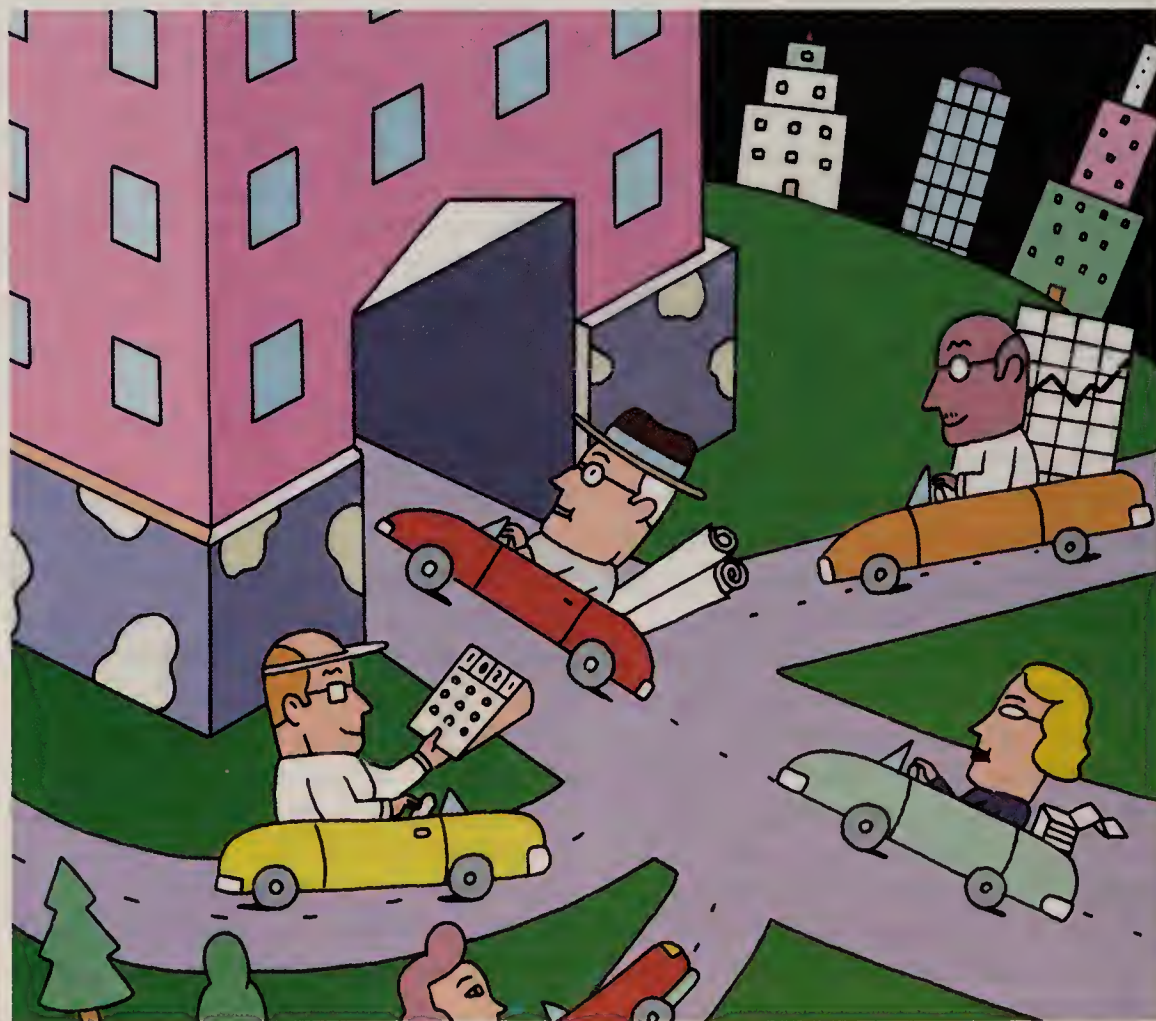


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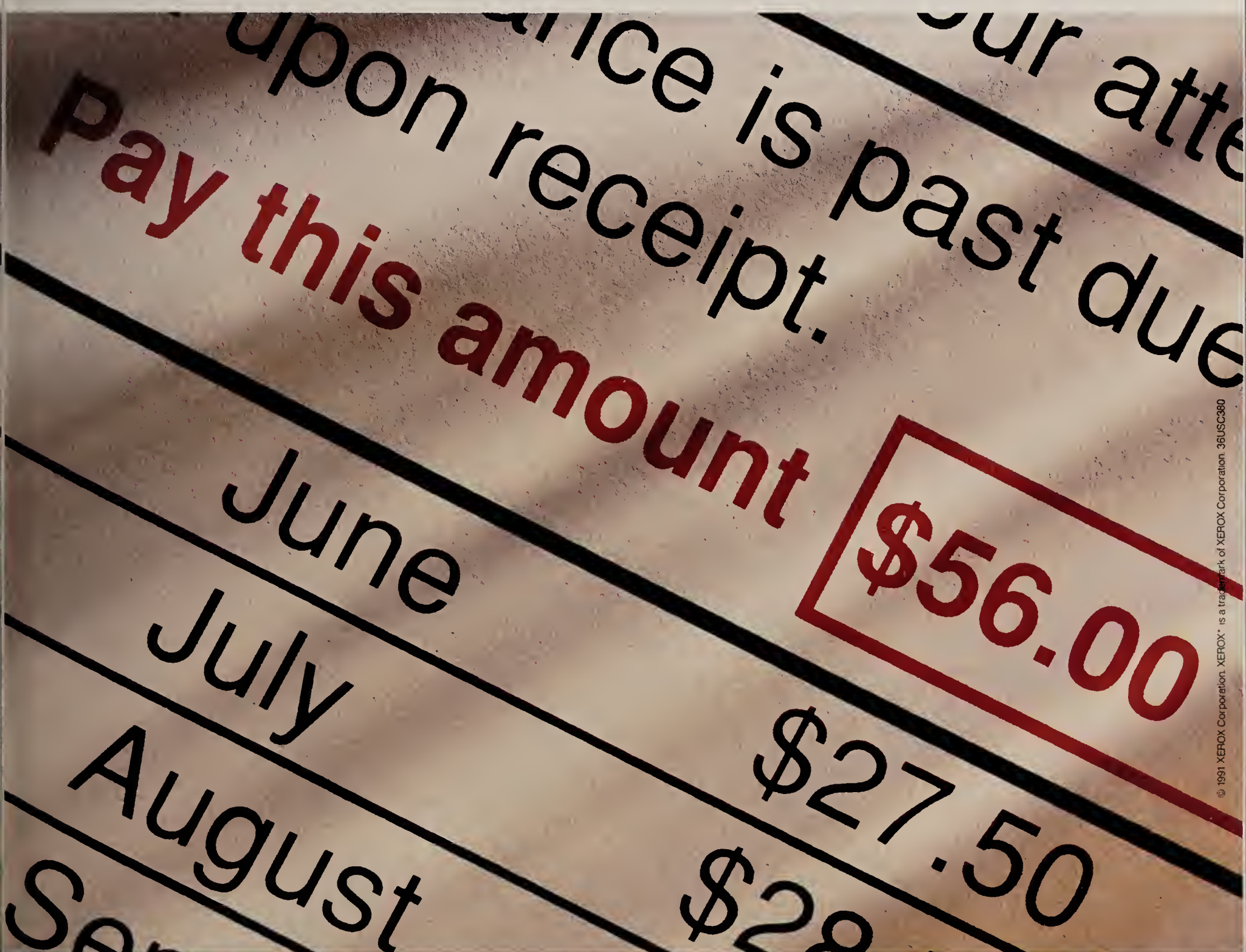
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ed as stand-alone. "There's absolutely no reason why you can't leverage [your existing systems] and bring in imaging as a bolt-on technology," said Sudhakar V. Shenoy, president of Information Management Consultants in McLean, Va. "Many companies have spent millions of dollars on mainframe technology, and there's all kinds of data stored in those systems. There are many ways of utilizing the information they have—of downloading it into the imaging system—and making one seamless, integrated system." This transition of electronic imaging from stand-alone application to technology integrator is a key factor fueling the growth of the industry.

For all its growth and good health, imaging has not taken off at the pace that analysts had predicted—at least not yet, noted Charles A. Pesko Jr., a board member and former CEO of BIS Strategic Decisions in Norwell,

"Businesses are very much in tune with imaging as a technology that allows them to redesign their business processes to give new or better services and product."

—Mike Antonelli

Mass.

"While our imaging-industry sales figures for '90 and '91 were pretty flat—just approaching a billion-dollar marketplace and really not moving ahead at the pace we would like to see—BIS forecasts say that by '95 this is going to be a \$12 billion mar-

ket, which means one hell of a ramp-up between now and then," said Pesko. Despite the steepness of the curve, there are reasons to take such forecasts seriously.

For starters, large-scale imaging systems have long sales cycles—often 12 to 24 months. So the expectation is that an increasing number of unconsummated sales that are already in the pipeline will hit the ledgers soon.

Several other factors support the expectation of impressive acceleration in the deployment of imaging technology. "Once you've got imaging in the door, the systems and applications grow quickly," Pesko said. "Further, while consultants, vendors and integrators have been picking their niches, the technology has been going in the opposite direction: from the specialized imaging application into the mainstream of mainframe applications."



The entry of imaging into the computing mainstream is a relatively recent event, but signs point to a lot of staying power. "Everybody has pretty much confirmed that this technology has tactical and strategic benefits," said Mike Antonelli, manager of application strategies for IBM's Image Solutions Marketing in White Plains, N.Y. "Two years ago, people were on the tactical side: reduced floor space, less copying costs, things like that—very tangible savings based on technology. Today businesses are very much in tune with imaging as a technology that allows them to redesign their business processes to give new or better services and product. The pendulum has swung over to the strategic side."

The strategic role imaging is playing heralds both long-term and wide-scale implementation of the technology. Users and vendors alike have

*Shifting from
managing the flow of
data to managing the
flow of work requires
reassessing how an
organization functions.*

expansive expectations.

It's the end of the beginning for imaging, according to Antonelli. "Imaging has moved out of the gee-whiz, dots-per-inch-on-the-screen, look-at-an-optical-platter phase to where it really is delivering something to the business," he said. What it's delivering is much more than the storage and movement of images of documents—rather than the paper documents themselves—around an enterprise. It's delivering the ability

to redesign and structure that movement and to provide sophisticated support for novel internal work processes.

The result is a growing set of capabilities that can be harnessed to offer enterprise-scale opportunities. "The information-processing community is going through a paradigm shift right now," confirmed Joe K. Carter, a partner at Andersen Consulting's headquarters in Chicago. "The mind-set used to be data management; now it's shifting to work management. It's no longer the care and feeding of databases." Carter expects it will take time for organizations to extend their operational focus in this way.

Making this extension is not without risk. Shifting from managing the flow of data to managing the flow of work requires reassessing how an organization functions and, in some instances, reassessing what the organi-



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zation is trying to do. This is a complex, time-consuming task that is rife with conflict and opportunities for error.

Often, existing systems-analysis and -development techniques are just not up to the task. "If what it takes is a whole lot of systems-level programmers to make these systems work, we're not going to get the growth we're looking for," said Phillip R. Trapp, president of TRW Financial Systems Inc., in Berkeley, Calif. "The [process-design and software-development] tools must be put in place." Developing the necessary tools will extend the vendors' resources, enabling them to keep pace with this rapidly expanding market.

S. Mark Roberson, former vice president of imaging product marketing at Unisys Corp. and now executive vice president and COO for EPL, a service and software company in Birmingham, Ala., agreed. "CASE-like tools are very much needed," he said. Almost of equal importance is the issue of who will use the tools. "We have to avoid making this solution so complicated that once it is developed, it cannot be maintained or enhanced by the user."

These sentiments were echoed by Allen W. Harris, director of the image systems consulting practice at Ernst & Young's New York offices. "Most CIOs know about image; they understand the concept of workflow," said Harris. "But they want to get clear: 'Exactly what jobs do I eliminate? How do jobs change? What's the training like? What's the impact on my own staff?' They don't want to be beholden to consultants forever. They don't want to be beholden to vendors forever. So how do they develop these resources internally?"

The answer lies in access to new computer-based development products. Products to help analyze needs, model the impacts of proposed systems, develop systems and aid in tuning the systems once they are implemented are key to accelerating the acceptance of imaging and to continued market expansion.

Carol M. Covitz, marketing direc-

tor for business solutions at Bull HN Information Systems in Billerica, Mass., noted that Bull is allocating more than 30 percent of its development resources to such products. "The most important tools that are coming along are automated prototyping and software-redesign tools that will actually allow end users in an IS organization to model their business," said Covitz. "They can then easily, without a lot of mumbo-jumbo, look at the business process that they're employing today and see what the end result [of changing the flow of work] will be." It's expected that these products will shorten the system-design and sales cycles dramati-

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mainstream of
computing.*

cally, in addition to empowering end-user organizations and providing new sources of revenue for vendors.

While such process-redesign products may well share a development lineage with CASE tools, they will be different, said IBM's Antonelli. "CASE will be complementary to workflow and process re-engineering," he said. "Because part of business-process redesign may be re-engineering existing applications, CASE tools could be very useful. But I envision the equivalent business-process design tools to be more process-oriented than oriented toward applications, languages or code. The point of process-redesign tools is that you can simulate steps in a business and see by changing one variable what

the effect is." The outlook is improving, said Antonelli, but the Lotus 1-2-3 of business-process redesign is not here yet.

This new class of products will aid in process re-engineering, allowing users to design new applications and expand imaging systems more readily in their own organizations. Such tools will accelerate system analysis and design, thus allowing vendors to serve more customers. And the products will allow customers to serve themselves, permitting many more organizations to develop systems that better leverage existing hardware, software and human resources.

As important as they are, the tools are a means to an end—not the be-all and end-all. "The thing that is critical is investing in the analytic portion up front," said Harris of Ernst & Young. "Merely having money is not going to bail you out of trouble. By using in-house resources, you're not necessarily going to get in trouble. The real issue is, are you prepared to do adequate analysis?" A host of major computer manufacturers and systems integrators are betting the answer is yes. And the payoff could be big dividends for vendors and end users alike.

Electronic imaging systems have gone beyond records management to offer organizations the means to do work in ways not possible before. The challenge now is for the imaging industry to assist in determining how enterprises should change. Tools that support process redesign are of critical importance to organizations implementing imaging systems; they also represent a new revenue source for vendors. By assisting users to assess current practices and by automating the process of modeling change, these toolsets will enable the development of more sophisticated and more integrated applications. In doing that, they may just lead the mainstream computing industry to a sunnier and healthier future. ☐

Scott Wallace is an independent industry analyst and journalist in Warwick, Mass.



How many public sector union employees does it take to change it? One. And twenty-five to supervise.

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FYI



Hard-Drivin' Computer

It is not unusual for Europe to seize on things—movies, television, music—that were first popularized in the United States. Now Tandon Corp. is hoping that its Pac system, which has been popular in Europe for four years, will hit it big in the domestic market. Toward that end the company has introduced PacII.

The PacII contains two modular hard-drive receptacles that accommodate DataPacII units—specially fitted hand-size packs equipped with shock mounting and a hard plastic case to withstand portable use. The DataPacII contains all of the computer's data, storage and software functions, allowing the user to transport the entire personalized program and files system from one terminal to another and lock these functions away for security.

In addition, Tandon's PacII system includes InPacII and AdPacII, modular units which accommodate other hardware. Prices for PacII range from \$2,686 to \$4,521. DataPacII units range from \$349 to \$1,799. For more information, call 800 800-8850.

One-Stop Calling

DirectTalk, a new voice-technology line from IBM, combines a host of voice-response and voice-messaging functions in a single package. The latest arrival in IBM's CallPath family of products (which coordinate telephone calls with computer applications), DirectTalk runs on PS/2 and RISC/6000 computers. With DirectTalk, businesses can automate routine customer call-in operations and also provide customers with information drawn from databases running on multiple IBM host environments.

For example, businesses may have their applications spread between an AS/400, a System/390 and a PS/2. With DirectTalk, customers can call in to learn about rates and services, schedule appointments, leave voice messages, pay bills and check balances—all in a single phone call, without transferring among departments. Businesses don't have to modify existing applications when implementing DirectTalk; they can also write applications tailored to specific business needs. DirectTalk can handle from four to 16 calls concurrently on a PS/2, or from 12 to 72 on an RS/6000. Prices start at \$23,450 (for DirectTalk/2) and \$41,000 (for DirectTalk/6000), depending upon the number of line connections. For more information, call 914 288-3508.

Let's (Not) Get Physical

Life is too short to waste fussing around in the wiring closet. Unfortunately, the more critical an organization's token-ring LANs, the more time IS personnel must devote to low-level problems in the physical layer.

Bytex Corp.'s Maestro Intelligent Switching Hub promises to get network administrators out of the wiring closet and give them more management control. The hub implements and maintains token-ring LAN configurations at a centrally located workstation. It supports up to 144 token-ring stations, connects any token-ring port to any of 32 rings, accommodates redundant power supplies and fans, and reports all events to the system.

The hub puts the physical switching of LAN components under software control. Managers simply indicate that they want to move a PC from one ring to another or replace a failed unit with a spare, and Maestro handles the reconfiguration or makes the switch online. The hub works in conjunction with the Maestro network-management system, control network and remote monitor. Pricing for the hub is \$250 per port and varies according to configuration. For more information, call 508 480-0840.



Light Years Ahead

Ricoh Corp.'s new Hyperspace optical drive won't take you to the other side of the galaxy in the blink of an eye, but its speed may be sufficient to make it practical for online network storage.

By replacing a two-step seek maneuver with a single motion, Ricoh has created a rewritable magneto-optical drive with a 37 msec average access time, a 28 msec average seek time and a spin rate of 3,600 rpm. The previous generation Ricoh drive managed 66.7 msec access time.

Though optical drives have been employed most often in single-user configurations, Hyperspace is better suited for secondary, online network storage, Ricoh said. As with other optical drives, Ricoh expects Hyperspace to find a home in document-storage and -retrieval applications, image processing, computer-aided design and other areas that move large data chunks. The 650MB, 5¼-inch drive sells for \$3,990 to OEMs, systems integrators and distributors. Ricoh can be reached in Los Altos, Calif., at 415 962-0443.



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Statement of Ownership, Management and Circulation
(Required by 39 U.S.C. 3685)

- Title of Publication: CIO
- Publication No. 08949301
- Date of Filing: October 1, 1991
- Frequency of issue: 18X/year
- No. of Issues Published Annually: 18
- Annual Subscription Price: Free to qualified subscribers/all other in U.S. and Canada \$94 U.S.
Foreign Subscriptions, \$175 U.S.
- Location of known office of publication: 492 Old Connecticut Path, P.O. Box 9208, Framingham, MA 01701-9208 (Middlesex County)
- Location of the headquarters of general business offices of the publishers: 492 Old Connecticut Path, P.O. Box 9208, Framingham, MA 01701-9280 (Middlesex County)
- Names and addresses of the publisher, editor and managing editor: Publisher, Joseph L. Levy, 492 Old Connecticut Path, P.O. Box 9208, Framingham, MA 01701-9208. Editor, Marcia Blumenthal, 492 Old Connecticut Path, P.O. Box 9208, Framingham, MA 01701-9208. Managing Editor, Lew McCreary, 492 Old Connecticut Path, P.O. Box 9208, Framingham, MA 01701-9208.
- Owner: International Data Group, One Exeter Plaza, Boston, MA 02116-2851.
- Known bondholders, mortgages and other security holders owning or holding 1% or more of total amount of bonds, mortgages or other securities: none.
- For completion by nonprofit organizations authorized to mail at special rates: Not applicable.
- Extent and nature of circulation:

	Average No. Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total number of copies printed (net press run)	62,205	68,986
B. Paid and/or requested circulation		
1. Sales through dealers and carriers, street vendors and counter sales	0	0
2. Mail subscriptions paid and/or requested	54,730	56,095
C. Total paid and/or requested circulation	54,730	56,095
D. Free distribution by mail, carrier or other means, samples, complimentary and other free copies	5,297	5,174
E. Total distribution (Sum of C and D)	60,027	61,269
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	5,178	7,717
2. Returns from news agent	0	0
G. Total (Sum of E, F1 and 2 -- should equal net press run shown in A)	65,205	68,986

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Leslie L. Falkner

Vice President, Operations

Editorial, Advertising and Business Offices: 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208--(508) 872-8200. **Postal Information:** CIO (ISSN 0894-9301) is published monthly, and semi-monthly in April, May, June, September, October and November by CIO Publishing Inc., 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. Second-class postage paid at Framingham, MA, and at additional mailing offices. **Reprints:** Copyright 1991 by CIO Publishing Inc. All rights reserved. Reproduction of material appearing in CIO is forbidden without written permission. Send all reprint requests to Permissions Editor, CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. **Photocopy Rights:** Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CIO for users through the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Massachusetts 01970. Please specify: ISSN 0894-9301. Permission to photocopy does not extend to contributed articles followed by this symbol: π . **Microfilm:** CIO issues end articles can be purchased on 16mm and 35mm microfilm and on 105mm microfiche through University Microfilms International, Serials Acquisitions Department, 300 N Zeeb Road, Ann Arbor, Michigan 48106. **Subscriptions:** Address subscription inquiries to CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208 or call (800) 788-4605. CIO is distributed free of charge to qualified top information executives. To all others, the one-year basic rate for the U.S. and Canada is \$94. For rates to other countries, please write the publisher. The single copy price is \$7. All subscriptions payable in U.S. funds only. Please allow four to six weeks for new subscriptions to begin. **Change of Address:** Please allow four to six weeks for change of address to take effect. **Postmaster:** Send change of address to CIO, P.O. Box 489, Northbrook, Illinois 60065-9816.

CONFERENCE CALL

QUESTION: *Do corporate E-mail users have a right to privacy?*

CIOs agree that corporate E-mail messages are best kept to business matters, but they strongly disagree on the usefulness of corporate privacy policies and whether companies should be allowed to control the medium.

Dale Crosnicker

Director of IS for Communications Satellite Corp. in Washington

“My personal opinion is that individuals who use E-mail have the right to privacy. An exception would be if someone is under an investigation of some sort, and police are looking for evidence to support some criminal act. Then going into someone’s E-mail is OK. There’s always the argument that the company owns the machine and so they own the information, but the same could be said about phones and voice mail.

“Professionally I would have trouble supporting anybody who wants information just for information’s sake. I can’t think of any business need for reading someone else’s mail. I think people who use E-mail need to be aware that when they use a corporate machine, there’s always a possibility that other people will look at their mail. Corporate policy [on E-mail privacy] is always vague and never published. It’s difficult politically to come up with a policy, because there’s uncertainty regarding legal ramifications. I don’t think it’s possible to come up with a good corporate policy until there’s something definitive. As a good measure, people have to be at least cognizant of the fact that what they are putting in E-mail could fall into the wrong hands.”

Fred Manteghian

Director of MIS for O&G Industries Inc., a commercial construction firm in Torrington, Conn.

“E-mail is no different really than a Xerox machine or a

company car or any other piece of equipment. It is company property; therefore it is used by and accessible to the company. Phones too are company property, but in order to listen in, that would have to be done by taping. That’s covered by law, but there’s been no extension of that to [internal] E-mail as far as I know. Legally we have the right to monitor anything.

“We have not issued a policy that specifically addresses E-mail privacy. I wouldn’t recommend to anyone that they issue such a policy, because although it may be a nice goodwill gesture, it could come back and bite you if you ever have a need to monitor a message.

“Most of our 80 users don’t think about the privacy issue. If I told them they could be monitored, I don’t think many of them would care. Most are sufficiently professional to stick with company business. I wouldn’t use the mail system for anything more than I would use memos or spoken conversation. That’s what they have the closed-door meeting for.

“If I ever suspected an individual of any kind of collusion or conspiracy that could affect our business, that might be a

reason to access a message. If I find out something I wasn’t supposed to find out, I conclude I can use that information because the courts haven’t said I can’t. If I release any individuals from their jobs, I doubt they would have the audacity to bring suit of unfair expulsion. I have that [E-mail] evidence, and I can disclose that evidence to a prospective employer and seriously curtail their career.”

Charles McNutt

IS director for the Central Vermont Public Service Corp. in Rutland, the largest electrical utility in the state

“I don’t take the view that E-mail is company property. E-mail should be treated like any other mail, like phone mail, U.S. mail. When a person sends a confidential message, they ought to have some assurance it will be private. It may be tempting to look at an intercepted message and use it against a person, but it’s not ethical. If any messages have been accessed, it’s been done surreptitiously. It wasn’t done on anybody’s request.

“I’m assuming most messages are not personal. But if there are personal messages being sent, the policy should be no more or less than what applies to interoffice memos sent in sealed envelopes.

“One of the problems we’ve had getting universal use of our E-mail system, especially by our senior officers, is the privacy issue. Do I want my messages intercepted or my calendar looked at? That was part of what prompted me to establish a privacy policy recently.

“The policy says that accessing deleted messages remaining in the system is not allowed even if a company officer requests it. Any request has to bubble up to the IS director, and he has to then seek legal counsel on the matter. I don’t want to be put into the position as IS director of doing something illegal.”



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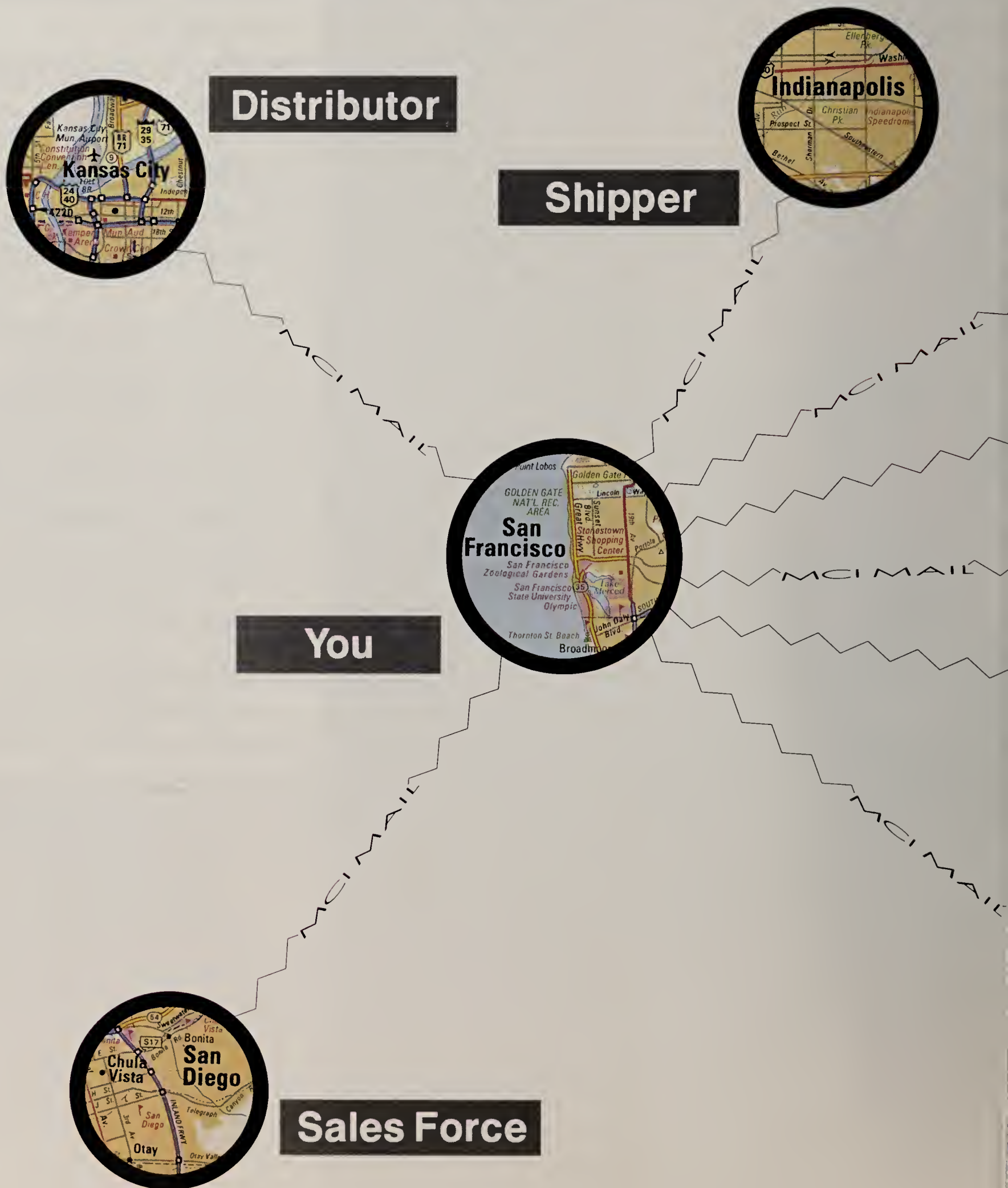
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*Source: *Computerworld* article, February 1991



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